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A

TREATISE
ON THE
NON-NATURALS.
In which the Great Influence They have on
Human Bodies
IS
Set forth, and Mechanically accounted for.
To which is ſubjoin'd, A Short Eſſay on the
CHIN-COUGH:
WITH A
New Method of treating that Obſtinate Diſtemper.

BY
JOHN BURTON,
M. B. Cantab. M. D. Rhem.

He that contemneth ſmall Things, ſhall fall by little and little.
ECCLES. XIX. I.

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Bookſellers, in *London*.

MDCCXXXVIII.

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TO THE

Learned and Judicious

Herman Boerhaave, M.D.

Profeſſor of Phyſic at *Leyden*.

SIR,

In forming Compliments, the ordinary Matter of Dedications, I am neither skill'd nor ſtudious: Beſides, that nothing of this Nature could be us'd with Propriety in an Addreſs to a Perſon, whoſe Sincerity and Candour ſtand foremoſt in a Throng of other ſhining Virtues and Accompliſhments. There would indeed be no Danger here of tranſgreſſing the Bounds of Truth, where the utmoſt Praiſes that can be utter'd would ſcarcely reach it. When ſo many valuable Excellencies centre in one Man, that ſeparate, would ſerve to make an hundred ſhine, Flattery can find no Place. It would be eaſy to run Encomiums on a Perſon, whom all the World agree to value and commend; but this is beſides my Deſign. I confeſs, my Intention in this Addreſs, is to ſcreen the Performance, in ſome Meaſure, from the Contempt it may deſerve, by letting the World know that I had once the Honour to be inſtructed ſitting at your Feet, where now I caſt my Book: And ill-diſcerning Malice muſt proceed with Caution, leaſt it blindly ſtumble on ſome ſolid Obſervation to cenſure, that has originally dropt from you. As I have gain'd my End, it would be unpardonable to detain you one Moment longer from the Public; your Time is a general Good, and whoever interrupts but an Hour of that Portion of it you have devoted to Buſineſs, is injurious to all Mankind. I can't make the World better Reparation for this my Treſpaſs upon it, than by ardently begging the long Continuance of that Life and Health, on which the Life and Health of ſuch Multitudes depend. With theſe good Wiſhes, I do myſelf Honour in ſubſcribing *myſelf*

Your moſt dutiful Pupil,

and ever oblig'd Servant,

York, Dec.
11, 1737.

John Burton.

THE

PREFACE.

M*ANKIND have afforded no ſtronger* Proof, *that I know, of their being knit together in one* Body, *or that they are Political Members of each other, than in the* Freedom *they are pleas'd to take in demanding a Reaſon and Account of each other's* Actions and Behaviour. *Far be it from me to go about to diſturb 'em in the peaceable Enjoyment of this Privilege, by enquiring into the* ungrateful Original of it. *They have been in Poſſeſſion long enough to plead a preſcriptive Right, and I quietly ſubmit to their Authority, without ſo much as* offering to ask *who made 'em* Examiners. *But at the ſame Time, I ſhall be ſo* bold, *as to acknowledge that my Submiſſion in* this

Particular, *is not ſo much owing to any Senſe I have of the* Legality *of this Dominion, which Mankind have ſo long exerciſed over each other, as from a certain* executive Power *they have lodg'd in themſelves, of* puniſhing *thoſe who are guilty of* Contumacy *towards them: For whoever has been ſo* hardy and refractory, *as to detain the* Motives and Reaſons *of their Actions and Behaviour from the* World, *have always found that the* World *would ſupply the* Deficiency, *by forming* ten times worſe Reaſons, *than the true ones would have been. 'Tis purely to avoid this* Inconvenience, *that I give myſelf or my Readers the Trouble of any* Preface *at all.*

But ſince it muſt be ſo, that ſome Account *muſt be render'd of what has put me upon appearing* in Print, *I ſhall give this as the firſt and principal Reaſon,* viz. *to ſatisfy thoſe, who are pleas'd to make it their Concern, that I have not* wholly miſemploy'd *the Time ſpent by me at* Leyden *or at* Cambridge. *The Book itſelf muſt ſpeak what ſort of* Advantage *I have made of my Study in either* Univerſity: *All that I would be here underſtood to ſay, is that I have* not been quite idle, *a* Circumſtance, *the World is very ready to underſtand* in the Affirmative, *unleſs they are well inform'd to the contrary.*

My ſecond Reaſon for printing theſe Sheets, is a Thirſt of Gratitude, *that I might have it in my* Power *to make public Acknowledgement of the many* Obligations *I am under to that firſt of learned Men the* great Boerhaave, *at whoſe Feet I had the Honour and Advantage to receive the greateſt Part of my* Education as a Phyſician.

After mentioning Gratitude *as a Reaſon for turning Author, a great* Love for the Public, *and a ſtrong* Deſire *to do Good to my* Fellow Creatures, *might very decently occupy the* Place *of a third Reaſon: And this* plauſible *Pretence lies as ready for my* Hand *as* another's, *and would become it as well, at leaſt, as it does* Thouſands *who make uſe of it altogether for the* Advancement *of their own* private Intereſt. *But I ſhall wave my Title to this third, to this beſt Reaſon imaginable,* (provided it was but true) *upon Condition only, that the* World *will forbear to give a* fourth, *and not ſay, it was the* Vanity *of being an early* Author, *that forc'd this indigeſted Treatiſe, this new Octavo, upon the Public.*

Having thus paid my Compliments to the World in general, by laying before 'em this full and true Account *of myſelf, and my Writing, I ſhall now caſt about to beſpeak the* Courteſy, *or at leaſt to ſpoil* the Edge of ill Nature, Envy and Detraction,

traction, *by being very free, and finding much Fault with the Book myſelf; this will, at leaſt, ſo far as it goes, ſpoil the* Novelty *of the future* Cenſure, *and rob* Calumny *of its moſt* poignant Pleaſure, *even that* Pleaſure *it feels, when it raiſes new Matter of* Grievance *in another's Breaſt.*

I have met with a Story ſomewhere, of a facetious old Man, who having the Misfortune to be a Cuckold, *could never vent any of his Pleaſantry, but the Reproach of his* Wife's Wants, *and her* irregular Method of ſupplying 'em, *was ever retorted upon him: Thus all his* Merriment *had like to have been ſpoil'd, had he not be-thought himſelf of the following* Stratagem; *whenever he came into Company he intended to abide by, he never fail'd to relate the* Misfortune *himſelf, and confeſs the* Cuckold; *this diſarm'd his Adverſaries at once, and procur'd him* Freedom of Speech, *ſo long as he choſe to ſtay amongſt 'em. I wiſh myſelf heartily as good Succeſs, while I follow this merry old Man's Method.*

The Thing then that ſtands foremoſt in a Book, and offers itſelf firſt to the Reader's Eye, is the Diction and Style, *and in this every* Reader, *that is, every one* that can read, *muſt be allow'd, if he pleaſes to demand it, to be a* competent Judge. *For my own Part, I look upon* *the following Pages to be, in this Reſpect,* dry and lean; *whoever therefore is of my Opinion I hope will do me the* Juſtice *to take me along with him; for I can aſſure him, I do as* heartily, *and as* ſincerely *wiſh it had been better wrote, as he or any one can, who pretends to be offended at its being ſo bad as it is.*

But notwithſtanding ſome Comfort *ariſes even here, from the many* grave *and* ſober People *ſtill left in the World, who look more for* Matter than for Words, *and who, if they meet with any Thing* ſolid, *and fit to entertain 'em, will attend* as little to the Manner *in which theſe Things are* deliver'd, *as the Author did whilſt he was employ'd in writing them. My chief Care, I muſt confeſs, has been employ'd in* collecting *and* laying up ſuch Materials *for the Work, as are* ſound and good, and not controverted, *and to deliver 'em* cloſely and conciſely, *by plain, clear and ſignificant* Expreſſions, *rather than by Rhetorical* Flouriſhes, *which oftner* obſcure *the Senſe, than* enliven *it (though in ſome Peoples Imaginations they make the Author ſhine) and are therefore not much to be regarded, where the Deſign is only to* inform the Ignorant; *pardon a Quotation from* Celſus, *much to the Purpoſe;* Morbos autem non eloquentia ſed remediis curari[*]; *therefore if what I have wrote anſwers this End,* viz. to inſtruct the Ignorant, *the unpoliſh'd* Style *need never give me much* Trouble *or* Concern.

There is indeed one Part of the Book, that which gives a long Detail *of the Weather for many ſucceſſive Seaſons, together with the partial* Aphoriſms *which are drawn from 'em, this, though as uſeful as any Part of the Book, is yet ſo very* dull, *that I would adviſe every* haſty *Reader to paſs it by, but, however, it could not be well* omitted, *without* naming the Subject; *and there are People in the World a-many, whoſe* Converſation *ſeldom riſes* higher *than this, who may poſſibly find Entertainment* even here.

If it be objected to me (as why ſhould it not?) that the Book is a mere Collection *from others, or what I have* pick'd up *from* Boerhaave's *Lectures and Converſation, and that there is nothing* new in it, *or of my own, nothing need be further ſaid in* Anſwer *to this, than that the numerous* Quotations *in the Margin, with Regard to the Authors that I have made uſe of,* confeſs *as much as may ſerve to ſatisfy the* firſt *Part of the Objection. What I have remember'd and put down from that* great Man, *and moſt* accompliſh'd *Phyſician is of the* utmoſt Value, *as coming from* one, *whoſe* Obſervations *and* Reaſons upon 'em *have a peculiar* Excellence, *and which the World might poſſibly have never receiv'd the* Benefit *of, if they were not thus tranſmitted to 'em by* thoſe *who have had the Advantage of his* Converſation and Inſtruction, *and if the Book abounded with* more of theſe, *they would have added much to its* Value, *as well as to the Reader*'s Benefit. *But if this Objection muſt take* Place, *it is* merely juſt *that I ſhould have the* Benefit *of it, and the* leſs that is properly my own, *the leſs I have to* be accountable for. *However, thus much* Merit *cannot fairly be denied me, that I have brought* abundance of Matter *together within a* ſmall Compaſs, *and made it to be cheaply procur'd, which could not have been ſo eaſily come at, if theſe Things had laid ſcatter'd up and down the Works of thoſe* many Authors *from whence I have drawn 'em.*

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[*] Præfat. pag. 10. lin. 33.

Health *is the greateſt earthly Bleſſing, and therefore Mankind can't have the* Notices, *which are proper to preſerve it, given* too often, *or in too great a* Variety of Shapes. *This Objection therefore, that there is nothing* new, *might be pleaded rather as a* Merit *in the Book, if I were diſpos'd to defend it as far as the Argument would bear, inaſmuch as there is no-*

thing *advanc'd without ſufficient* Vouchers, *which may*, by ſome, *be look'd upon as commendable a Thing in a* Phyſician, *as in Divines, who in the publiſhing their Thoughts, make it a Part of their Study, to advance* nothing *but what is agreeable to the eſtabliſh'd* Standard of Faith.

But however, this Objection is not ſtrictly true; *for in the little Treatiſe of the* Chin-Cough, *there is a Method of* Cure laid down, *which is* wholly my own, *and which no one* ever practis'd *before myſelf*; *and if it prove generally* ſucceſsful, *as I have Reaſon from my own* Experience *to hope it will, the* Credit of that, *however, I may* claim as my own; *and if this was* all, *it is a Merit* many more bulky Books than mine *have not to plead*

Mr. Lock, *in his Preface to a large Quarto Volume, makes no other Apology for writing the* Whole, *than the Explanation of* one ſingle Paſſage in St. *Paul*; *and I hope the Authority of that great Man in* Point *may defend my* ſlender Pretences.

Another Thing I expect will ſtand in the Way of the Book, is my Want of Years and Experience; *and this is an Objection, I confeſs, I know not how to come off of.* Comforts of their Hearts *who have the Advantage of Age to plead*; *for* my own Part, *I own it is a* Bleſſing *I am very eaſy to have at a* Diſtance: *This therefore*

therefore is an Objection that I muſt leave with thoſe, who have the Happineſs to hit upon it, to make their moſt of, for 'tis what I can't poſſibly help.

There is one Thing more, that it ſtands me much upon to defend, as what will bring upon me the moſt bitter Reſentment *of ſome* few Gentlemen of the Faculty; *and that is the great* Freedom *I have taken, in decrying Mathematics* as uſeleſs in the Cure of Diſeaſes; *though by the way, the* Benefit *of it was never* well made out, *either to their* own, *or other* Peoples Satisfaction: *But however, as this* ſmart Objection *is ready form'd to their Hands, I doubt not but it will be* vigorouſly diſcharg'd *upon me; and my Quarrel to the Mathematics will* ſurely be ſaid *to be the ſame with the* Poor's Quarrel to the Rich, or the Ignorant to the Learned; *and that I* decry *this* truely valuable Branch of Learning, *becauſe I am poſſeſs'd of a very* ſmall Share, or nothing of it: *I ſhall be bold to keep it to myſelf, whether* I underſtand this Science or not, *and only ſay in my Excuſe, that I have not deliver'd* one tenth Part *of what I could have done, againſt this* ſhowy, but falſe Pretence. *A late ingenious Author and good Phyſician, has furniſh'd Matter ſufficient upon this Head; and it was a* Point of Curteſy, *as well as* Self-denial, *that a great deal of it* *was not produc'd. Leaſt I ſhould be thought to boaſt of* Materials that I have rejected without ſufficient Grounds, *I ſhall venture to make one Quotation here, which, if it ſerve for* nothing elſe, *will, at leaſt,* divide the Odium, *and direct the Reader to much more of the* ſame, *if he be diſpos'd to look for it: The Paſſage* (and a ſevere one it is) *is this*; The Pretence to Mathematics, or the Uſefulneſs of it in the Cure of Diſeaſes, is a Cheat, and as errant a Piece of Quackery, as a Stage and a Merry-Andrew.

It will not be improper at Parting, juſt to caution the Reader againſt being ſurpriz'd, or over-witty, *when he finds the moſt* common, ordinary and loweſt Facts in Nature *here taken Notice of. In Subjects of this Importance,* Invention *and* ſmart Conceits, *which afford the* principal Entertainment to light Minds, *who can reliſh* nothing *of greater Weight, are not at all to be admitted*; *whilſt many of the moſt* important Conſequences *may be drawn from the Obſervation of the* meaneſt Things *in Nature. And I hope that thoſe who will give themſelves the Trouble of reading over* the Whole, with a grave Attention, *will find, after all, that it is* not altogether an uſeleſs Speculation.

I ſhould here, before I have done, make an Apology for the many Errors of the Preſs; *but as no* Human Prudence *can* *prevent groſs* Blunders *creeping into an Impreſſion of this Kind, I hope the Reader* will not be over ſevere, *in charging them upon me.*

This is all I can find in my Heart to ſay againſt my Book *and to ſay any Thing more in its* Defence *may not be thought* becoming: *But in Truth, whatever may be ſaid by me* here, *the Book muſt nevertheleſs* ſtand or fall by its own intrinſic Merit, *now it is ſubmitted to the Public. And though it ſhould ſo happen, that it procure* neither Credit to the Author, nor Advantage to the Reader, *which is the worſt that can be dreaded I promiſe to bear the Diſappointment, ſince it is* no ſuch uncommon Caſe, *without much Wonder or Concern.*

THE CONTENTS.

INTRODUCTION.

Page
THE Theory of Phyſic has been influenc'd by the Philoſophy in Vogue. 1
The Neceſſity of a true Method of ſtudying Phyſic. 2
Which is ſhown by Boerhaave. 3
Whence he has given Offence to many; and to whom. 4
The Fault's in thoſe who cavil, and not in the Science. 5
The Error of thoſe who follow Experience only. 6
The Error of thoſe who follow Theory only. 8
Why Phyſic is ſo little improv'd by Chemiſtry. 9
Why by Anatomy, and why the Mathematics are an Injury to Phyſic. 10
The Neceſſity of a true Theory ſhown. 12
An Human Body is to be conſider'd as a Machine. 15
The mutual Dependence of the Solids and Fluids upon each other. 17
The Effects of a relax'd State of the Fibres ſhown. ib.
The Effects of a too rigid State of the Fibres. 21
The Effects of a too viſcid State of the Humours. 22
The Effects of a too ſharp State of Humours. 24

CAP. I. On AIR.

Page
NOn-naturals what, and how many. 27
Air, what. 28
The Neceſſity and Uſe of an Inquiry into its Nature. ib.

Page
Hippocrates's *Obſervations upon Air uſeful to us, and why, namely, that the Effluvia and Vapours will have a proportional Effect.* 30
How the Air is affected by Effluvia from Vegetables. 39
How the Air is affected by the Effluvia from Animals. 42
How the Air is affected by the Ova of Inſects floating in it, and in Water. 46
How the Air is affected by Mineral Exhalations. 50
At what Seaſon of the Year the Air is fill'd with moſt ſalubrious, or inſalubrious Particles. 62
The vivifying Spirit of Air. 63
The Effects of the various Temperatures of the Air: Firſt, of Hot Air. 68
Secondly, of Cold Air. 74
The Effects of moiſt Air, and of dry Air. 76
Heavy and denſe Air. 81
Light or rare Air. 83
Warm or moiſt Air. 87
Hot and moiſt. 88
Cold and moiſt. 89
Cold and dry. 90
The Advantage of adapting the Air to the Exigence of the Caſe. 91

CAP. II.

Page
O*N Epidemics.* 95
A cold and moiſt Seaſon, after a warm and pleaſant one in October. 97
A cold and moiſt October. 98
A ſevere Froſt in Winter. 99
Cold Froſty Weather for ſix Weeks, with South Winds. 102
A hot Summer, with Weſterly Winds. 104
A cold and froſty Winter. 105
A hot and dry Summer. ib.
A cold and moiſt Autumn. 106
A cold, froſty, and ſnowy Winter. 107
Summer and Autumn hot and dry. ib.
Summer exceeding hot and dry, chang'd ſuddenly to Cold for a Fortnight, and then the Heat return'd, and for the Seaſon was warmer 'till November. 108

The

Page
The whole Year droughty, but not ſo hot as the laſt. 113
A moiſt, cold, rainy Seaſon to September, *thence to* November *warm and pleaſant, and the Winter was mild.* 115
Spring and half Summer cold, wet, and rainy, with Northerly Winds. 117
Summer dry, but not hot in Proportion, with Northerly and Eaſterly Winds to the Beginning of Winter. 118
Sudden Cold in Autumn. 121
Summer cold and wet, with North Wind to the Beginning of Winter, then a ſharp Froſt for a Week, then was very wet and rainy, with North Winds. 122
From January *to the Middle of* April *warm and pleaſant, with Southerly and Weſterly Winds.* 124
Snow in March. 125
From the Middle of April *to* December, *cold and wet.* 126
January *ſharp and froſty.* 128
In February *cold Rains, Snow and Froſt alternately.* 129
May *hot and dry, with South and Weſt Winds.* 130
June *and* July *wet and moiſt, with chiefly North Winds.* 132
Auguſt *pleaſant and warm,* September, October *and* November, *were changeable, rather inclinable to cold and moiſt.* 133
Moſt of December *was cold and froſty.* ib.
The reſt of Winter cold, but in other Reſpects inconſtant. 134
The End of March *was warmer, with Abundance of Rain, this State laſted to the Middle of* April, *which was warm and pleaſant.* 135
From the Middle to the End of May *colder, with much Rain.* 137
Unſettled Weather to the Middle of July, *then was hotter to* September. 138
September *and* October *cold and moiſt, then Froſt with North Wind for a Fortnight, then cold and moiſt to the Middle of* December, *then a hard Froſt for three Weeks,* Junuary *cold and ſnowy, with North Winds.* 141

Moſt

Page

Moſt of February *warm for the Seaſon.* 142

March *warm, but in other Reſpects inconſtant, and the Beginning of* April *warmer than uſual, with warm continued Rains.* 143

June *hot and dry, with Weſt Winds, Middle of* July *was cooler with North Winds and ſome Rain, and* Auguſt *was dry, but cooler than uſual.* 146

September *cold, with North Winds. The End of* October *and* November *warm, with a South Wind and Rain, then was a hard Froſt with ſome Snow.* 148

About Chriſtmas *a cold Froſt, with Snow for a Month,* February *very cold, with Snow and a hard Froſt.* 149

March *dry and cold, with Northerly Winds: In the firſt Half of* May *fell cold Rains with North Winds. the latter Half was warmer, but in a leſs Degree than uſual.* 151

June *and* July *was hot and dry, and alſo* Auguſt, *to the Middle of* September. 152

Chriſtmas *was clear and pleaſant, with South Winds. About the Middle of* January *it was cold, with North Winds, and ſome Snow fell; thence to the End of* February *was warm; in the Beginning of* March *ſome Snow fell, and cold Rains with North Winds.* 157

The End of April *was warmer, with a Weſt Wind.* 158

The Beginning of May *cold and dry, with North Winds. Middle of* May *was hotter, with Showers; thence to* Auguſt *was colder and wetter than uſual; then ſome Weeks of ſerene, pleaſant Weather ſucceeded.* 159

The latter End of Autumn and Beginning of Winter were wet to the End of November; *then ſucceeded a hard Froſt.* 160

January *and Beginning of* February *much Snow with Froſt; after the Froſt a Drought ſucceeded, with ſharp North Winds, which continued to the Middle of* April. 161

Page
Cold Rain, with Eaſt and North Winds, to the Beginning of May ; *to this ſucceeded a warm State of Air, with gentle South and South-Weſt Winds.* 163
The Heat abated, but the Drought continued to the End of Auguſt, *when ſome ſudden Rains fell.* 164
Which continued to September, *with South Winds.* 165
Aphoriſms *deduc'd from this Chapter, from Page* 182 *to Page* 188.

CAP. III.

Page
DIET neceſſary to be conſider'd in a Medicinal Way. 189
The Simplicity of Diet among the Ancients. 190
In what Manner Diet affects our Bodies : Firſt, By its Quality. 199
—— *By its Quantity.* 202
The Importance of a proper Diet. 208
The Diet proper for a rigid, and for a lax State of the Fibres. 213
Proper Diet for an acid Acrimony. 215
—— *For an alcaline Acrimony.* 217
—— *For the muriatic Acrimony.* 219
Proper Diet when the Humours are too thin. 220
An Account of the Effects of Coffee, Tea, and Chocolate. 221
The moſt proper Times of Eating. 230
Diet preferable to Medicine. 232
The Intenſions of Drink, how many, what they are, and what anſwers them beſt. 235
Purity, &c. *of Water.* 237
The Effects of too little Quantity of Drink, 240
—— *of too great a Quantity of Drink.* 241
Where Spirituous Liquors are neceſſary. ib.
A ſhort Account of different Liquors. ib.
The Effects of too free an Uſe of Spirituous Liquors. 242

CAP. IV.

Page
THE Medicinal Uſe of Exerciſe, how firſt found out, and how eſteem'd by the Ancients. 245
A Mechanical Account how it is beneficial, and why preferable to Medicines. 250
The Effects of too much or too little muſcular Motion. 254
How to make Exerciſe the moſt beneficial. ib.
Exerciſe by Carriage. 256
Rules to be obſerved in Bathing. 264
Wherein Bathing is proper. 268
The Method in Bathing to be alter'd according to the Exigence of the Caſe. 269
The Uſe of warm Baths. 273
The Benefit of Friction. 278
What Exerciſe is beſt. 281

CAP. V.

Page
THE Benefit of Sleeping and Waking. 283
The Effects of too much Watching. 286
The Effects of too much Sleep. 288
The propereſt Time for Sleeping. 289

CAP. VI.

Page
THE firſt Part of Digeſtion. 292
The Uſe of the Saliva. 293
The Effects of too great Excretion of the Saliva. 294
——— *of too little Secretion of the Saliva, its Quantity, and how its Secretion is promoted.* 297
Cyſtic Bile, what, &c. *and the Effects of its too great Excretion.* 301, 302
Hepatic Bile, what, &c. *Pancreatic Juice, what,* &c. 303
The Effects of it's too great Excretion, and too great Suppreſſion. 304

Page
The ſecond Part of Digeſton. 307
The laſt Part of Digeſtion. 312
The Effects of a Suppreſſion of Urine. 319
——— of too great Excretion. 320
The Neceſſity of underſtanding the Nature and Uſe of the perſpirable Matter. 322
Perſpirable Matter, what, and how ſecreted; and alſo Sweat, what, and how ſecreted, or excreted. 323
——— if ſtop'd in one Part, either is promoted in another, or a Diſeaſe enſues. 325
——— It's Obſtruction cannot be compenſated by increaſing any of the ſenſible Evacuations. 326
The Effects of a diminiſh'd Perſpiration. 327
——— of its too great Excretion. 328
It's Supply is cut off by an Increaſe of the ſenſible Evacuations. 329
The Effects of too frequent Coition. 330
The Effects of ſtopping an acquir'd as well as cuſtomary and natural Evacuation. 331
Too great Excretion of Blood, and a Suppreſſion of the natural Evacuations. 333

CAP. VII.

Page
THE Manner how the Mind affects our Bodies. 334
The Effects of Anger and Joy. 338
The Effects of Fear and Sorrow. ib.
The Concluſion. 341

Page
ESSAY on the Chin-Cough. 345
Indications of Cure, what. 347
The Method us'd. 349
The Virtues of the Bark. 352
The Bark prov'd to anſwer two of the Intentions. 356
The Temperature of the Air, and the Seaſon ſhown in which the Chin-Cough was epidemical, wherein the Bark was firſt given. 358

Page
The Bark made yet more efficacious, by mixing Cantharides with it. 361
Their internal Uſe ſafe, and practis'd by the beſt Phyſicians in all Ages, and in moſt Countries, ſhown. 362
Their Compoſition and Manner of Acting ſhown. 366
The Compoſition and Manner of Acting of Camphire ſhown. ib.

ERRATA.

PAGE 4. laſt line in the Notes, for *Empirics*, read *Emperics*; p. 19. l. 19. for *Lencophlegmatia's*, r. *Leucophlegmatia's*; p. 31. l. the laſt in the Notes, for *Prideux*, r. *Prideaux*; p. 38. l. 23. for *Cæra*, r. *Cera*; p. 39. l. laſt but one, for *Expen.* r. *Exper.* p. 41. l. 21. for *putrify'd*, r. *putrefy'd*; p. 42. l. 21. for *Putrifaction*, r. *Putrefaction*; p. 43. l. 19. after *Paræus*, dele the *Comma*; p. 46. l. 6. for *Senitantes*, r. *Scrutantes*; p. 55. l. 27. for *Ramazani*, r. *Ramazini*; p. 57. l. 14. after *other*, r. *were*; p. 72. l. 2. for *bilioſe*, r. *bilious*; Ib. l. 5. for *bilioſe*, r. *bilious*; p. 76. l. 16. for *Lencophlegmatia's*, r. *Leucophlegmatia's*; p. 78. l. 1. for *ædematous*, r. *œdematous*; p. 84. l. 24. for *Bronchiæ*, r. *Brouchia*; p. 102. l. 1. for *flow*, r. *flow'd*; ib. l. 5. before *Wintringham*, r. § 3. ib. l. 24. for *does*, r. *do*; p. 109. l. 27. for *are*, r. *were*; p. 110. l. 11. for *bilioſe*, r. *bilious*; p. 117. l. 15. for *are*, r. *were*; p. 118. l. 11. for *are*, r. *were*; p. 128. l. 25. after *of*, r. *the*; p. 144. l. 12. for *ſeems*, r. *ſeem*; p. 147. l. 26. for *does*, r. *do*; p. 149. l. 15. after *Peripneumonies*, r. *appear'd*; ib. l. ib. after *true*, make a *Colon*; p. 150. l. 14. for *Epedemics*, r. *Epidemics*; p. 151. l. 2. after *Winds*, make a *Comma*; p. 153. l. 7. after *Phlegm*, make a *Comma*; p. 158. l. 22. for § 16. r. § 18. p. 173. l. 19. for *Pyſician*, r. *Phyſician*; p. 190. the marginal Note ſhould be at § 2. p. 208. in the marginal Note, for *Importante*, r. *Importance*; p. 224. l. 2. for *ſlip'd*, r. *ſit*; p. 253. l. laſt, in the Note, for *and* r. *ad*; p. 255. l. 23. for *quæ*, r. *quæ*; p. 260. l. 13. for *Hoyer*, r. *Floyer*; p. 262. l. laſt ſave one, after *Wideneſs of*, r. *the*; p. 299. l. laſt, for *Motgag.* r. *Morgag.* p. 300. l. 19. for *it*, r. *they*; ib. l. 20. for *mixes*, r. *mix*; p. 305. l. 16. for *ſubtle*, r. *ſubtile*; p. 306. l. 21. for *ſubtle*, r. *ſubtile*; p. 307. l. 24. for *litur*, r. *liter*; p. 308. l. 23. for *ſubtle*, r. *ſubtile*; p. 318. l. 8. for *Cohæſion*, r. *Coheſion*; for *Diarrhæa*, r. *Diarrhœa* through the Book; for many *Semicolons*, put *Comma's*; for *Fæces*, r. *Fœces* quite through the Book.

INTRODUCTION.

The Theory of Phyſic influenc'd by the Philoſophy in Vogue.

§ 1. THE Theory of Phyſic has, in all Ages, been influenced by the Philoſophy then in Vogue; thus the Ancients introduc'd the Elements, and their four Qualities, from whence they deriv'd their Temperaments: Others have had Recourſe to innate Heat, radical Moiſture, a preſiding Spirit, aſtral Powers, occult Qualities, Sympathies and Antipathies, and many ſuch like abſurd Notions; by which, they endeavour'd to account for the ſeveral Phænomena of Diſeaſes. But the Moderns, with a great deal of Reaſon, have quite exploded ſuch a fantaſtical Way of philoſophiſing; and with much Induſtry and Succeſs, have endeavour'd to account for every Thing that relates to the Animal Œconomy upon Mechanical Principles. This they have done, both as being the beſt Means of getting clear of all ſuppoſititious, deluſory Hypotheſes; and alſo, the only Way, by which, we are enabled to arrive at any ſatisfactory Knowledge in the Works of Nature.

The Neceſſity of a True Method of Studying Phyſick;

§ 2. It is well known that a true, ſhort, rational Method of Studying, is of the utmoſt Importance; more eſpecially in our Univerſities, where there are ſo few Inſtructors in this Science: For how many a bright Genius, at firſt ſetting out in theſe Studies, have been ſo embarraſſed and perplex'd with theſe various, abſurd, and unintelligible Syſtems of philoſophiſing; that finding themſelves unable to account for the ſeveral Phænomena of Diſeaſes from them, they have been plung'd in ſuch endleſs Labyrinths of Error, as they could never extricate themſelves out of.

§ 3. But *Boerhaave*, that ſecond *Hippocrates* (who by an uncommon Sagacity, and unparallel'd Induſtry, has ſearch'd deeper into the Arcana of Nature, than any who have wrote before him) has reduc'd the Study of this Science to ſo ſhort, eaſy and rational a Method, that Perſons, with a proper Application and Capacity, may in much leſs Time acquire that clear, ſatisfactory Knowledge therein, which they in vain flatter'd themſelves with the Hopes of attaining, by purſuing their former injudicious Methods: For he has wiſely applied the noble Diſcoveries that have been made; and from a great Variety of Chemical, Mechanical, and Anatomical Experiments, and a compleat Knowledge of the Ancients, has form'd the conciſeſt and beſt Syſtem, that has ever yet appeared: A Syſtem, free from all manner of Trumpery, and that very probably, will ſtand the Teſt of all ſucceeding Ages: This is the Service that great Man has done us, and by it, has given us a much greater Advantage over all the Ancients, than either

which is ſhewn by Boerhaave;

either the Diſcoveries in Anatomy or Philoſophy were able to give us before.

whence he has given Offence to many; and to whom.

§ 4. This generous Undertaking of his has given great Offence to thoſe, who, not having their Heads turn'd that Way, delight in their occult Qualities, radical Moiſtures, Malignities, and ſuch like Jargon, Emperic-like *, and cannot bear to ſee their great Myſteries of Phyſic laid open; and that excellent Frame, which is its Subject, mark'd out like a Spot of Ground or Piece of Timber, with Rule and Compaſs: Yet, notwithſtanding all the Care and Induſtry of theſe People, who decry and run down all Attempts of this Nature, I am fully perſwaded it muſt be owing, either to their Want of Attention to this Sort of Reaſoning, or their Want of Capacity to deduce Conſequences from Antecedents (by which alone, they can be able to purſue theſe Enquiries) that they ſo obſtinately perſiſt in their own Notions.

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* The Author does not mean that Sect of Phyſicians among the Ancients ſo called, which took its Riſe in the 38th Century, in the Reign of the Second or Third *Ptolemy*; but he means the modern Empirics.

§ 5. It is for this Reaſon I ſhall endeavour to convince them, the Fault is not in the Science, by its not affording ſufficient Principles to reaſon from with Certainty, but in themſelves, and in their Ignorance of the Means, by which that Certainty is to be obtain'd: For when a Perſon has got a true Notion of the Structure of the human Body, the Nature of the Solids and Fluids, the Manner how vital, natural, and animal Functions are perform'd; the Nature of the Secretions; the Effects either of increaſing or diminiſhing any Evacuation; and has a competent Knowledge of Natural Philoſophy; he is then properly qualified to reaſon ſcientifically upon the Nature of Diſeaſes, and the Operations of Medicines, ſo as to deduce a juſt Method of Practice therefrom; which he, who is utterly ignorant of theſe Things is incapable of, whatever Character he may bear among the general, tho' leſs underſtanding Part of Mankind.

The Faults in thoſe who cavil, and not in the Science.

The Error of thoſe who follow Experience only.

§ 6. Theſe are the Men, who rejecting all Reaſoning in Phyſic, mock at any Rationale on Drugs or Diſeaſes, and patronize Experience only. It is certainly right, in ſome Meaſure, to rely upon Experience; but if we build entirely upon it, we ſhall find nothing is more fallacious. Men of Experience only, are the moſt frequently deceiv'd of all Mankind; they depend entirely upon Analogy and Similitude for their ſole Guide: This Caſe, ſay they, ſeems like the Caſe of ſuch a Patient, who was cured by ſuch a Method of treating; in the ſame Manner therefore will we proceed in this Caſe alſo: Thus the Proceedure proves of as dangerous Conſequence, as the Miſtake proves greater or leſs; for they are not able to diſcern between differing Similitudes, and like Differences.

This Method is eaſily diſcovered to be fallacious and dangerous, by any, who are the leaſt converſant in the Science of Phyſic: By this Method it is, that the old Practitioners pretend a Superiority over thoſe, who may often have more real Knowledge than themſelves.

Experience without Theory will never make a ſafe, and skilful Phyſician, any more than any other Science can be obtain'd, without being acquainted with the Rules upon which it is founded; and he that is conducted only by Appearances, without being able to reaſon about their minuteſt Differences, will never ſee an Error 'till paſt Recovery. Thus *Sydenham* *, though he was one who ſtood up as much for Experience as any

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* *Epidem.* Cap. 2. Pag. 5. Hoc ſaltem pro comperto habeo ex multiplici accuratiſſimarum obſervationum fide, prædictas Morborum ſpecies, præſertim Febres continuas ita toto, quod aiunt, Cælo differre, ut qua methodo currente anno ægrotos liberaveris, eadem ipſa anno jam vertente forſitan e medio tolles: Quodque, ubi ſemel in genuinam medendi rationem, quam hæc vel illa Febris ſpecies ſibi vendicat, auſpicato inciderim, ad eundem ſcopum collimans (favente, ut fit, optimo Numine) metam quaſi ſemper attingam, reſpectu ad temperamentum, ætatem & reliqua ejuſmodi uſquequaque habito, donec extincta illa ſpecie novoque gliſcente malo, anceps rurſum hæreo, qua mihi via inſiſtendum ut ægris ſubveniam, ac proinde niſi ingenti adhibita cautela intentiſque omnibus animi nervis, vix ac ne vix quidem poſſum efficere ne unus aut alter eorum, qui ſe primi meæ curæ commiſerint, vita periclitetur, donec inveſtigato jugiter intrepidus denuo procedam.

whatſoever, ſtill owns the Neceſſity of Reaſoning about the Differences of Diſeaſes.

The Error of thoſe who follow Theory only.

§ 7. On the other Hand, they who rely wholly upon Reaſoning, are as much or more in the Wrong; for the greateſt Maſters of Reaſoning have often prov'd the moſt unſucceſsful Interpreters of Nature, by neglecting to conſult Nature it ſelf, and over-looking the moſt obvious Phænomena. *Ariſtotle*, with all the Advantages of a great Genius, and moſt uncommon Opportunities of improving Philoſophy and Phyſic, made no better Uſe of them, than from ſome abſtract Notions of Matter, and certain fictitious Elements and Qualities, to imagine himſelf able to account for all the Appearances of Nature; and fancying ſome Chimerical Analogy betwixt the Macrocoſm and Microcoſm, the Natural and Animal Œconomy, endeavour'd to make all Things chime in with his whimſical Hypotheſis.

Phyſicians ſoon adopted *Ariſtotle*'s Notions, and reaſon'd from the ſame Principles, and for many Ages nothing was heard in the Schools but Wrangling and Diſputes about Words, uſeleſs Diviſions and Diſtinctions of Qualities and Forms, and various Interpretations and Gloſſes of *Ariſtotle*'s and *Galen*'s Writings. No one, in all this Time, thought of ſearching out the Truth of Things, of confirming or diſproving any doubtful Opinion by Experiments, and careful Obſervations of Facts, but relied entirely upon their Maſter, and ſquar'd their Practice by his Hypotheſis.

Why Phyſic is ſo little improv'd by Chemiſtry;

§ 8. The Chemiſts indeed threw off the Yoke of School Philoſophy, and pretended to eſtabliſh a new Theory upon Experiments; but theſe Experiments were few, and very much wreſted and miſapplied: Their Fondneſs for ſome Experiments made by Fire, led 'em to neglect all other uſeful Enquiries into the Structure of the human Body, the Nature and Properties of the Fluids contain'd tain'd in its Veſſels, and the Laws by which they mov'd within them; vainly imagining ſuch violent Motions in a human Body, as were altogether inconſiſtent with the Life of an Animal.

Why by Anatomy, and why the Mathematics are an Injury to Phyſic.

§ 9. When Anatomy was brought to ſo great a Perfection as it has of late Years attain'd to, we then might have hop'd to have ſeen a thorough Reformation of Phyſic, and to have been able to proceed with a greater Degree of Certainty than heretofore; but they depended ſo much upon their Mathematical Reaſoning from the Structure of the Body, that they alſo fail'd of the deſir'd Succeſs; the very Data upon which they built their Reaſoning, being either abſolutely falſe, or impoſſible to be made appear.

For my Part, I can't agree with a very great Man, who ſays, that a thorough Knowledge of the Mathematics, ought to be made the diſtinguiſhing Characteriſtic of a Phyſician from a Quack; for the Mathematics can give us no more

Help in the Cure of Diſeaſes, than they can in explaining the Myſteries of reveal'd Religion.

I rather agree with *Baglivi*, that Mathematics, Rhetoric, Aſtronomy, *&c.* are as conducive to an exact Hiſtory and Cure of Diſeaſes, as the Art of Painting is to Muſic. Dr. *Beal* obſerves, it is impoſſible to diſcover certainly the natural Dimenſions of the Canals in a human Body, even in a healthy State, much leſs is it poſſible to determine accurately their various Degrees of Contraction and Dilatation, which may, and actually do produce Diſeaſes; hence every Thing built upon ſuch Hypotheſes muſt fall of courſe. Who can refrain from laughing, when he reads a Table that is publiſh'd in the *Philoſophical Tranſactions*, N° 302, and 314? In which the Names of all the Purgatives and Emetics are ſet down, and by Mathematical Rules adjuſted to every Conſtitution in all Ages; the Author ſays, the Doſes of the Medicines are as the Squares of the Conſtitutions; which are as eaſy to find out as the

Squares of Goodneſs or Generoſity, or elſe of Wickedneſs and Avarice in any Man. Hence we ſee it is doing a great Injury to young Students, to put them upon endeavouring to reduce theſe Things to a Mathematical Certainty, or even to ſpend much of their Time in ſtudying Mathematics; for when a Man ſets out wrong, the more he goes on ſtrait, the farther he is out of his Way.

Some of theſe Sort of People have argued themſelves into a Belief of Facts being real, which had no other Exiſtence than in their own Imagination; ſo that how abſurd ſoever we may think *Ariſtotle*'s monarchial, deſpotic Government of the Heart; *Des Cartes*'s Flaſhes of Fire contained in the Parenchyma of the Muſcle, or *Van Helmont*'s Archæus to be, there are not wanting of their Succeſſors, much more modern, who have been no leſs confident in aſſuming their Poſtulata.

The Neceſſity of a Theory.

§ 10. Whoſoever therefore tries the Powers of his own Mind in attending to theſe Things, will find no true Satisfaction, but from the ſame Aſſiſtances and Means of Conviction, by which he obtains the Knowledge of any ordinary Machines.

Therefore, if there be any ſuch Thing as Medicinal Science, it muſt proceed upon demonſtrable Principles; becauſe it is converſant with Objects diſcernable only by the Evidence of Senſe, without which, it is mere Chance and Confuſion, and the Emperic and Enthuſiaſt are upon as good a Foot as the Scholar and Phyſician: Not that here I would be underſtood to ſpeak of abſolute Certainty in all Inſtances of Theory and Practice; but I ſay, the Theoriſt will attain to a greater Degree of Certainty, than any other; and, in every Step he takes, will run much leſs Hazard of failing of Succeſs than they, who proceed in the contrary Method; for the Emperic and Experimenter are altogether in Uncertainty, having no Rules whereby to make even Obſervation it ſelf of real Uſe. Every one muſt allow, how conducive ſoever towards the Improvement of Medicine Obſervations may be, yet they are only ſo, when made the Foundation of ſolid Reaſoning; which, though it be the Meaſure and Standard of all our Actions, and the Baſis of Arts and Sciences, has nevertheleſs been leaſt regarded in this. 'Tis for this Reaſon, that formerly ſuch ſmall Advances have been made in Phyſic, which would probably have been brought to a greater Degree of Perfection than it now is, had it been treated as it ought to have been, and conſider'd rather as a Science, than an Art; ſeeing its Object, namely, a human Body, as it is one of the moſt ſurprizing Pieces of Mechaniſm, ſo are its Diſtempers owing to an Irregularity in the Motion, Quantity, or Quality of its Fluids; or to a bad Texture and Diſpoſition of the Solids: Now all theſe being only different Modifications of Matter, muſt undoubtedly be examined, and explain'd, by the known Laws of Mechanics.

The true Phyſician therefore is he, who has modell'd his Experience into a

Rationale; ſuch a Man can never fail of Succeſs, but when the Parts are abſolutely deſtroy'd, or Nature is ſo weak, as to be unable to perform her Office.

A human Body to be conſider'd as a Machine.

§ 11. We ſee therefore, notwithſtanding the excellent Contexture, and wonderful Variety and Fineneſs of the Parts whereof a human Body is compos'd; yet when even this moſt finiſh'd Piece of the Creation comes to be conſider'd with Regard to its Structure, and the Mechaniſm, by which the Functions of its ſeveral Parts are carried on (in order to find out the beſt Methods, either of continuing thoſe Functions perfect, or of regulating them when diſorder'd) we ſhall find ourſelves under a Neceſſity of uſing it no better, than any other Part of the Material World; becauſe herein, we can't come to any Knowledge of its Mechaniſm, without taking it in Pieces like any other Machine, and conſidering all the Parts as ſo many Springs, Wheels, and the like Mechanical Powers, which, by Virtue of their particular Figures, Magnitudes, and Contextures, are enabled to perform their ſeveral Functions: And to this Purpoſe, notwithſtanding the wonderful Variety, both in the Number and Structure of its ſeveral Parts, they are, throughout the Whole, to be conſider'd as ſo many Mechanical Inſtruments, or Powers, all adapted to, and acting in Subordination to each other, in ſuch a Manner, as to concur to the Support of the Whole; and in this due carrying on all the Purpoſes of the Œconomy, ſeeing their Dependences on each other is ſo order'd, that any one Part cannot ſuffer without bringing Diſorder upon the Whole; the Structure therefore and Powers of the moſt minute Parts are, as in any other curious Movement to be known, in order to find out the propereſt Method of regulating the Diſorders.

The firſt Step neceſſary to be taken, ought to be from the moſt ſimple and eaſy Notices we have of it, and from thence, by Degrees, to enter into its moſt minute Parts, in order to explicate it's remote Diſorders and unheeded Properties; and to this End it very naturally comes to be conſider'd as it is compounded of Solids and Fluids.

The mutual Dependence of the Solids and Fluids upon each other.

§ 12. The Solids, of which the Organical Parts of the Body are compos'd, are entirely vaſcular; through theſe, ſeveral Fluids are continually propell'd with various Degrees of Velocity: Theſe Fluids are of different Kinds, according to the various Exigencies of the Animal Œconomy. From hence we ſee their neceſſary Relation to, and Dependence upon each other; for the Solids are nouriſhed from the Blood, and are thereby enabled to perform their Functions, which depend upon their Elaſticity; by means whereof, the Blood is prepar'd to ſupply ſuch Nouriſhment to the Solids as is neceſſary for their Support.

The Effects of a relax'd State of Fibres.

§ 13. Firſt then, let us conſider what will be the Conſequence of a relax'd State of the Fibres and Viſcera; if they are too weak and lax, we ſhall then ſoon be fill'd with ſharp or viſcid Humours, or both, according to what Sort of Food we eat; hence the Circulations, Perſpiration, Digeſtion, and Secretions, will be weaker and more languiſhingly perform'd than ought to be; by which, neither the Food, nor Viſcidity of the Blood will be ſufficiently broken, nor divided ſmall enough by the Force of Circulation, nor it's Excrements thrown off; for while the Blood circulates too ſlowly, neither Perſpiration nor any other of the Secretions or Excretions can be rightly perform'd, neither can the Fibres aſſimulate our Food for Nouriſhment, but it becomes viſcid, whence Obſtructions in the Viſcera; for we know that the different Fluidities of the Blood in ſeveral Parts of the Body, are as their Velocities in each Part, and their Velocities are as the contracting Force and it's Reſiſtances; where then there is the greateſt Reſiſtance and the weakeſt Contraction, there the Blood will be thickeſt; in thoſe Parts therefore, where there is the greateſt Quantity of Fluids in Proportion to the Force of the containing Veſſels, there muſt needs be the greateſt Reſiſtances;

fore the Fluids in thoſe Parts will ſooner ſtagnate than in any other, and ſuch Parts are the Liver, Spleen, Meſenteric Glands, *&c.* whence Jaundices, Hypochondriac and Hyſteric Affections.

When theſe Fibres are weak, the Heart meets with too great a Reſiſtance; for we know that it is the Elaſticity of the Arteries that propelles the Blood forward, after it comes from the Heart; if theſe be weak, then the Blood moves ſlower through the Arteries than from the Heart; hence Anxieties in the Breaſt, and ſlower Circulations; hence, on either a ſudden or quick Motion, proceed Palpitations, Syncope's, *&c.* becauſe the Blood comes faſter to, and through the Heart, than the Heart can propel it through the Arteries: From this Weakneſs ariſes Leucophlegmatia's, Tumors, and Inflations of the Veins; for we know that the Blood is an Elaſtic Fluid, which in a Vacuum will expand it ſelf very much *; ſo that the weaker the Veſſels are, the more will

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* *Philoſoph. Tranſact.* Abridg. Vol. II. Pag. 228.

they be inflated and puffed up; this is yet more evident in Conſumptive People, who, ſeven or eight Days before their Death, have all their Veſſels very turgid, and their Blood is leſs ponderous.

If People, whoſe Veſſels are very weak and lax, ſtir too much (nay, ſometimes even the very Air changing ſo as to contract the external Veſſels) the inward Veſſels will ſometimes eaſily burſt; hence various Kinds of Extravaſations of Blood, Serum, or the like, Spots in the Skin, Stagnations, *&c.* hence Diarrhæa's, Dyſenteries, Spitting of Blood, making Bloody Urine, and many ſuch like Evils; in ſhort, all the Functions, both vital, natural and animal, will be impaired; and whatever we eat and drink will follow its own proper Indoles.

People of this Sort of Conſtitution generally have a ſmall, weak, languid, and, ſometimes, intermitting Pulſe; are commonly complaining of Coldneſs, eſpecially in the extreme Parts; are very apt to catch Cold, and are quite ſpent in exceſſive hot Weather. Theſe Sort of People have moſtly a white, fair, wax, or aſhen-colour'd Complexion; looſe and flabby Fleſh and Muſcles, and ſoft, thin, bright colour'd Hair; they are chiefly ſubject to chronical Diſorders, ſuch as Atrophies, Dropſies, *&c.*

The Effects of a too rigid State of Fibres.

§ 14. Fibres and Veſſels, when too rigid, are leſs flexible, ſtraiter, ſhorter, and reſiſt the Impulſe of the Liquids; hence a great Nixus and Renixus betwixt the Heart, Blood, and Veſſels, the Veſſels propel the Blood with great Violence, and then the Circulation is quicken'd; then there is a greater Attrition betwixt the Veſſels and Fluids, and betwixt the Parts of the Fluids alſo; hence a greater Heat; and where the Attrition is greateſt, there will be alſo the greateſt Heat, and that is in the Lungs: All the Excretions are as the *Vis Applicationis liquidorum ad Oſcula Vaſorum*, ſo that by how much more the Blood is mov'd, by ſo much more are the Excretions increas'd, and by that Means the Blood is deprived of it's moſt liquid Parts; hence it contracts an inflammatory Viſcidity; hence Obſtructions, either from the Violence of the Circulation forcing Globules into Veſſels, which they ſhould not enter, or from the Viſcidity; hence Inflammations, Suppurations, Gangrenes, Pleuriſies, Peripneumonies, Polypoſe Concretions, &c.

By the violent Attrition and Heat, the Blood is reſolv'd into its volatile, acrid, and alcaleſcent Salts and Oils, as the Colour and Smell of the Urine ſhows *.

The Effect of a too viſcid State of Humours.

§ 15. Now we will ſuppoſe the Solids to be perfectly right, and the Fluids to blame; if they be too viſcid, the Circulation would be retarded, becauſe of the greater Preſſure upon the Sides of the Canals, and the Obſtructions in the Capillary Veſſels; all the Secretions wou'd be hinder'd; and then the Solids wou'd be weaken'd for Want of due Nouriſhment; if the Humours abound in too great Quantities, then the Veſſels are too much diſtended and dilated, which being kept too long upon the Stretch, are at laſt, like a Bow-ſtring, weaken'd and loſe their elaſtic Tone; if this viſcid Blood happens to obſtruct in the Lungs, it there cauſes Dyſpnæas, Aſthmas, and Coughs; if in the Head, Apoplexies, Vertigo's, Lethargies, Dimneſs of Sight, Deafneſs, *&c.* if in the Liver, a Jaundice; if in the Spleen and Glands of the Viſcera, the Hypochondriac and Hyſteric Affections; if in the Kidnies, nephretic Pains; if in the Skin, Spots, Tumors, *&c.* and, if the Perſon moves ſuddenly (the Blood in the larger Veſſels circulating quicker than in the ſmaller) Palpitations of the Heart, Syncope's, *&c.* all the Secretions are hinder'd; for Want of animal Spirits, Faintings, and a Lowneſs of Spirits; this glutinous and viſcid Humour obſtructing in the Veſſels, preſſes upon the Sides of the Veſſels more ſtrongly than a thinner, and thereby preſſing upon the Nerves, interrupts their natural Actions, or In-flux; hence various Contractions and Tremors.

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* Dr. *Langriſh* analys'd the Blood both of an healthy Perſon, and one in an acute Fever, and found that the Lymph in the latter, was more charg'd with volatile Salt and Oil, than the other, and fermented more violently with Acids. *Modern Theor. and Pract. of Phyſic, Pag.* 85. He alſo analys'd the Urine of Perſons well, and of others in an acute Fever, and found a great Difference in this alſo. *From Page* 93, *to* 105.

The Effects of a too ſharp State of Humours.

§ 16. If the Humours are too ſharp and acrimonious, they will deſtroy the Veſſels; and, by twitching and vellicating the Nerves, will produce Spaſms, Convulſions, and launching Pains; and often cauſe ſcorbutic and cancerous Sores and Ulcers.

§ 17. Thus we ſee, that a bad State either of the Solids or Fluids, ſoon affects and changes the other; and as all chronical, and ſome acute Diſtempers, take their Riſe from Humours, either being too viſcid, or too thin, or too acrimonious; or from the Solids being too lax, or too rigid; we are under a Neceſſity of ſtudying thoſe Things, which make ſuch Changes in our Conſtitution, and theſe are, what we call the Non-naturals, and therefore ought to be our chief and principle Study; becauſe if they are once well underſtood, we may often be able, not only to foretel ſome chronic and epidemic Diſtempers, but alſo to know how, either to prevent or cure them. It is for Want of a due Care in the Management of the Non-naturals, that we do not oftner ſucceed in the Cure of chronic Diſtempers; for, can any Thing be more irrational, than for one in a hectic, or ſcorbutic Habit, to indulge his Palate with eating aromatic, pungent, ſaline Pickles, or Sauces, to his Meat? Or for one in a Cachexy, Obſtructions in the Glands, or the like, to eat all Kinds of Fiſh, Fleſh, Fowls, ſalt Meats, or leguminous Foods, and to eat plentifully of 'em at a late Supper, ſtill laying heavy Loads upon the Stomach, wearing out the Tone of it; and filling the Veſſels with thick, crude, and undigeſted Fluids, daily laying up and rivetting greater Obſtructions in the ſmall Veſſels, and hoarding up, as it were, certain Cauſes of Diſeaſes, and even Death itſelf? I ſay, what Succeſs can ſuch expect from Medicines? Old *Hippocrates* * bids us be careful of ſuch, for he ſays, *The more you nouriſh impure Bodies, the worſe they are.*

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* Sect. 2. Aph. 9.

So that, if either the Patient be obſtinate, or the Phyſician not attentive to the regular Uſe of the Non-naturals, what can Phyſic do?

Having ſhewn the Conſequences of a preternatural State of both the Solids and Fluids, either as to Laxity or Tenſeneſs of one, or the Viſcidity, Tenuity, or Sharpneſs of the other; I ſhall now proceed to enquire how the Body is affected by the various Alterations of the Non-naturals, in order to induce the Effects above-mention'd; whence we may be able to deduce a Rationale of the Cauſes of thoſe Diſtempers of the human Body, with proper Means of removing them.

A
TREATISE
ON
NON-NATURALS.

CAP. I.

AIR.

§ 1. THE Non-naturals are ſix in Number, 1. Air; 2. Meat and Drink; 3. Exerciſe and Reſt; 4. Sleep and Waking; 5. Things retain'd, that ſhould be excreted; and too great an Excretion of what ſhou'd be retain'd; 6. Affections of the Mind.

Non-naturals what, and how many.

Air what. § 2. By Air is meant that elaſtic, compreſſible Fluid, which ſurrounds our Terraqueous Globe, call'd the Atmoſphere: The lower Parts whereof, in which we live, and are continually breathing, are charged with an infinite Variety of aqueous, terreſtrial, metaline, animal, and vegetable Particles; which, by the various Mixtures and Proportions, produce conſiderable Alterations in its State, whereby our Bodies are variouſly affected, as will be made appear in the enſuing Enquiry.

Neceſſity and Uſe of an Enquiry into its Nature. § 3. As it is plain from many Experiments, that an Animal Body abſorbs, or imbibes, the Vapours floating in the Air, ſo it is evident, that as the Air is more or leſs impregnated with Corpuſcles, or Principles of this or that Sort; or as they happen to coaleſce or unite with other Principles of a different Nature, they may be exalted into dangerous Weapons, and become the Inſtruments of ſundry Diſeaſes; hence we ſee the Neceſſity and Uſe of an Enquiry into its Nature, which was alſo known to *Hippocrates*; for, ſays he [*], *Whoever would underſtand Phyſic, it is firſt neceſſary that he underſtand the Seaſons of the Year, and then their Effects on our Bodies.* In another Place he ſays [†], *We ought to know the Conſtitutions of the Air, what they are, and in what Times and Regions they moſtly appear.* In another Place he ſays [||], *That Diſtempers ſeldom ariſe from any other Cauſe than the Air; for either it is too much or too little, or abounds with infectious Filth.* In another Place he ſays [§], *The Air is to be conſider'd as to its Heat or Cold, Thickneſs or Thinneſs, Dryneſs or Moiſture, and their ſeveral Changes.* From his Obſervations of theſe Things, he wrote the Third Section of his Aphoriſms, in which, he not only gives us an Account of the Diſeaſes which come at particular Seaſons; but alſo has given us the Symptoms, which are conſtant Attendants on the various Temperaments of the Air, and could often foretel the Coming of Diſeaſes: If the ſame Method, with the ſame Perſpicuity and Integrity, had been purſued by his Followers to this preſent Time, we then ſhould more clearly have underſtood the Nature of Epidemics, which now often puzles even the beſt, and moſt skilful Phyſicians, as *Sydenham* ſays *.

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[*] Hippocrates, lib. de aere locis & aquis, pag. 280.
[†] Hippocrates, de morb. epidem. lib. 4. pag. 1138.
[||] Hippocrates, lib. de flatibus, pag. 297. lin. 6.
[§] Lib. 6. de morb. popular. ſect. 8. pag. 1199.

Hippoc. *Obſervations upon Air uſeful to us, and why; namely, that the Effluvia and Vapours will have a proportionable Effect.*

§ 4. I know there are ſeveral Writers ſay, that there is ſuch a Difference betwixt the Temperature of the Air in *Greece*, and this of our own Iſland, that *Hippocrates*'s Obſervations are to us entirely uſeleſs; but how ſpecious ſoever this Aſſertion ſeems, Experience as well ſhews it to be falſe, as that it expoſes their Ignorance: Thus far indeed muſt be allowed, that particular Winds are not equally noxious or innocent, with Reſpect to different Places and Situations; for ſome Winds blowing over long Tracts of Land, not only bring aqueous Vapours, but alſo all Kinds of Exhalations and Effluvia, both from Vegetables, Minerals, and Animals; and is therefore either noxious, or innocent, according to the Place from whence, and over which they blow: Such a noxious Wind was that, which was ſo deſtructive, that in one Night ſlew 185000 *Aſſyrians* in *Sennacherib*'s Army *, when he was going to deſtroy *Jeruſalem*, and which often blows there. All other Winds which blow over, or from the Sea, bring only aqueous Vapours; and yet, even in this Caſe, *Hippocrates*'s Aphoriſms, and Books of Epidemics, may be of great Aſſiſtance to us: I do not mean, that the ſame Wind, from the ſame Quarter of the Globe, will have the ſame Effect here, as there; but the ſame Winds which brings watery Vapours ſimply hither, will have the ſame Effect on our Bodies here, as that Wind which carried watery Vapours ſimply thither, notwithſtanding they ſhould blow from different Quarters.

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* Vid. Introduction to this Book, Sect. 6. Pag. 7. in the Notes.

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* *Thevenot*'s Travels, Part 2. Lib. 1. Cap. 20. and Part 2. Lib. 2. Cap. 16. Part 1. Lib. 2. Cap. 20. *Prideux* Connection, Vol. 1. Part 1. Lib. 1. Pag. 24.

On the other Hand, Wind blowing from one particular Quarter, is at the ſame time wholeſome to one Country or Climate, and deſtructive to another, as many Authors prove; I need only to mention *Hollerius* *, who ſays, the South Winds are unwholeſome to *Italy*, and to all the Northern Parts; but moſt wholeſome to the Coaſts of *Africa*; for the Benefit which the *Italians*, &c. receive from the Eteſiæ †, that, the *Africans* receive from the South Winds, and *vice verſa.*

Before we read that excellent Book of *Hippocrates*, it will be neceſſary to conſider the Situations of the chief Places where he made his Obſervations, and compare them with that of ours.

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* *Libel. de Peſte*, Pag. 577. *N. B.* There is about five Climates Difference betwixt the North of *England*, and the Iſlands where *Hippocrates* made his Obſervations.

† The Eteſiæ are North Winds, which blow about the Riſing of the Dog-Star, and continue about forty Days, cooling the Heat of the Sun; if they are wanting, the Seaſon becomes unwholeſome. *Hipp.* in 1 *Epid.* T. 7. and Cap. 3. *Epid.* T. 6. & Lib. 2. Sect. 3. 5. Aph, *Plin.* Lib. 2. Cap. 47.

Le Clerc ſays (*a*), *Hippocrates* made his Obſervations at *Athens* (*b*), *Cranon* (*c*), *Ænus* (*d*), *Æniades* (*e*), *Elis* (*f*), *Pheræ* (*g*), *Perinthus* (*h*), *Thaſus* (*i*), *Abdera* (*k*), *Olynthus* (*l*), and *Lariſſa* (*m*), where he died, being Towns of *Thrace*

(*a*) Hiſtoir. de la Medic. part 1. lib. 3. cap. 32.

(*b*) *Athens*; the moſt famous City of all *Greece*, in *Attica*, *Hip*. lib. 5. cap. 2. epid.

(*c*) *Cranon*; a City upon the *Phthiotis*, *Magneſia*, and *Pelaſgiotis*, not far from *Phera*, mention'd in Cap. 2. Lib. 2, and 4, and 6 Epid.

(*d*) *Ænus*; a City of *Thrace*, at the Mouth of the River *Hebrus*, next the Bay of *Melas*: It was formerly call'd *Abſinthus*, mention'd in Cap. 2. Lib. 2, 4. 6. Epid.

(*e*) *Æniades*; a City in *Ætolia*, at the Mouth of the River *Achelous*, right againſt *Ithaca*, the Kingdom of *Ulyſſes*, mention'd in Cap. 2. Lib. 5. Epid.

(*f*) *Elis*; a City in the Kingdom of *Elis*, in *Peloponneſus*, famous for the Celebration of the Olympic Games, mention'd in Cap. 2. Lib. 5. Epid.

(*g*) *Pheræ*; a City of *Theſſaly*, in that Part of it call'd *Phthiotis*, by *Cranon*, mention'd Cap. 2. Lib. 5. Epid.

(*h*) *Perinthus*; a City of *Thrace* in *Propontis*, call'd afterwards *Heraclea*, mention'd in Cap. 1 and 2. Lib. 2. and Cap. 3. Lib. 6. Epidem.

(*i*) *Thaſus*; an Iſland between *Neapolis* and *Abdera*, upon the Coaſt of *Thrace*, mention'd Cap. 2. Lib. 1, 3, 6. Epid.

(*k*) *Abdera*; a City upon the *Thracian* Coaſt, at the Mouth of the River *Neſtus*, mention'd in Cap. 2. Lib. 1. Lib. 3, 4, 5, 6, 7. Epid.

(*l*) *Olynthus*; a City in *Chalcis*, between *Potidæa* and *Acanthus*, mention'd in Cap. 2. Lib. 5, 7. Epid.

(*m*) *Lariſſa*; a City of *Theſſaly*, in that Part of it call'd *Pelaſgiotis*, upon the River *Peneus*, mention'd in Cap. 2. Lib. 1, 3, 5.

and *Theſſaly*, where he alſo wrote his Aphoriſms (*n*); yet he was often at *Smyrna* (*o*), and ſometimes in *Libya* (*p*) and *Scythia* (*q*).

Now by *Hollerius* (*r*) it appears, that their Southerly Winds, which came from the Sea, brought moiſt, cloudy, warm Weather, and are to them the moſt unwholeſome *: Do not our South Winds do the ſame?

* *That Country being ſo very hot withal, makes that Wind more unwholeſome than ours.*

Their Northerly Winds are moſtly cold, and dry, blowing along the Continent, and purifying the Air from theſe Vapours, and are therefore to them much whole-

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(*n*) Jacob. Hollerius, Præſat. ad Comment. in Aph. Hippoc. pag. 2.

(*o*) *Galen*, Comment. 1. in Lib. de Articul. *Smyrna* is a City of *Ionia*, built by the *Amazons*, forty Miles from *Epheſus*, the Country of *Homer*.

(*p*) *Libya*; all the Country between the Kingdoms of *Tripoly* and *Ægypt* was formerly call'd *Libya*, or *Libya Exterior*; the reſt between this and the Weſtermoſt Parts, *Libya Interior*, mention'd Cap. 1. Epid. Cap. 3. Prognoſt.

(*q*) *Hieronymus Mercurialis*, Section in Medicin. Scriptorib. Lib. 2. Cap. 18. *Scythia* is now call'd *Tartary*, is divided into the *Aſiatic* and *European*. That in *Aſia* compriſes a vaſt Quantity of Land about Mount *Imaus*; that in *Europe* lies about the *Euxine* Sea, and the *Palus Mæotis*.

(*r*) Comment. in Aph. Hippoc. Aph. 5. Sect. 3. Aph. 8. Sect. 3. and Libell. de Peſte, pag. 577.

wholeſomer than any other: Do not our Northerly Winds the ſame? Hence we ſee that there is not ſo great a Difference as ſome would inſinuate; therefore what *Hippocrates* ſays of their Winds, may be applicable, in a great Meaſure, to ours; as any one may be ſoon convinc'd of, if he will give himſelf the Trouble to examine impartially. I wou'd not have any one ſuppoſe, that I am arguing there is no Difference betwixt the two Climates; I only mean, they are much alike with Reſpect to the Winds.

It muſt certainly be allow'd by every one, that there are ſome particular Diſtempers more frequent in ſome Countries, than in others: Yet, on the other Hand, it is alſo evident, that Obſervations made in one Country, do agree, for the moſt part, with thoſe made in another; altho', perhaps, not in every particular Point: And it is alſo evident, that the Change of the Air, either to hot or cold, wet or dry, or the like, will affect two different Climates in the ſame manner, in Proportion; *ex. gr.* ſuppoſe two Climates;

in the firſt, the Thermometer to ſtand at 20 Degrees, in the other, at 40; the Conſequence will be, that upon either an Increaſe of Heat or Cold, the Thermometer in each Climate, will riſe or fall in Proportion to the increas'd Heat or Cold; and for the ſame Reaſon, our Fibres will be relax'd or contracted; our Fluids rarify'd or condens'd; our Perſpiration promoted or obſtructed in the ſame Proportion: Hence we find Pleuriſies, Peripneumonies, *&c.* are common to all Climates or Countries whatſoever; but yet we find they vary ſometimes in ſome particular Symptoms, as well when we compare thoſe in one Country with thoſe in another, as when we compare thoſe in one and the ſame Climate; hence it is very plain, that either on a ſudden Aſcent or Deſcent of the Spirit and Mercury in the Thermometer and Barometer, whether in Winter or Summer, our Bodies will be affected in different Climates alike in Proportion.

Moreover, if we accurately compare the Temperature of the Air, with the

Epidemics that accompany it, deſcrib'd by *Hippocrates*, and compare them with thoſe Epidemics, in the ſame Temperature of Air, in our own Climate, we ſhall find them very much alike.

Hippocrates had neither Thermometer, Barometer, nor Hygroſcope, to meaſure either the Heat, Weight, or Moiſture, of the Air; yet none of his Succeſſors have made ſuch juſt and accurate Obſervations upon the Air, and its Effects, as he did: He judg'd only according to his Senſes, which, with Reſpect to the Effects of Heat and Cold upon our Bodies, is a more certain Guide than the Thermometer; *ex. gr.* ſtagnant Water is, by the Thermometer, of the ſame Degree of Heat as the ambient Air; but, being apply'd to our Bodies, feels colder; ſo that the Air, abounding more or leſs with aqueous Particles, is *cæteris paribus*, colder or hotter to our Senſes, the Thermometer ſtill remaining at the ſame Height; for the greater Quantity of Matter is contained in the ſame Space, the Heat or Cold will be, in ſuch Proportion, greater to our Senſes: Hence Water ſeems colder than Air; and, as Lord *Verulam* (*s*) obſerves, the Froth of any Liquor ſeems warmer than the Liquor it ſelf; and the Powder of any ſolid Body, ſeems warmer than the ſolid Body it ſelf, tho' the Thermometer ſtill proves the Heat in each to be alike: The ſame may be ſaid of Winds; for the greater the Impulſe is, the greater, *cæteris paribus*, will be the Senſation of Cold *. However, theſe Helps, join'd to thoſe of our Senſation, greatly aſſiſt us in making our Obſervations the more accurate (*t*).

* *And Wind drives away the hot Steam that ſurrounds our Bodies, and thereby cool 'em.*

§ 5. Ve-

(*s*) Hiſt. Nat. & Experiment. de Ventis, Cap. de Forma Callidi, pag. 143.

(*t*) Diſeaſes caus'd by one particular Conſtitution of the Air, do not ſhew themſelves very often 'till that Conſtitution is chang'd, which ſhews the Neceſſity of comparing their Succeſſions, as Lord *Bacon* obſerves, in *Sylvâ Sylv*. Centur. 4. p. 213; and yet the ſame Cauſe does not affect all Conſtitutions alike:

Limus ut hic dureſcit, & hæc ut cæra liqueſcit
Uno eodemq; igne———Virg. Eclog. 8. Line 80.

But the Symptoms are various, according to their various Conſtitutions; nevertheleſs, as *Sydenham* informs us, one and the ſame Method in ſuch Epidemics will, in a general Way, ſucceed; and where they firſt begin, there they firſt end, as *Sennertus* obſerves, *De Natur. Peſtilent.* Cap. 1. pag. 372.

How the Air is affected by Effluvia from Vegetables.

§ 5. Vegetables contribute very much towards the Salubrity, or Inſalubrity, of the Air; as well when cut down and decaying, as when growing and in an healthful State; for we know that the moſt volatile Parts of all Vegetables will riſe and evaporate, by a Degree of Heat, much leſs than that of the Sun in Summer; as we can prove, both by Chemiſtry (*u*), and alſo by our own Senſe of Smelling: Hence we are convinc'd by theſe Means, as well as by Mr. *Hale*'s Experiments (*w*), that Vegetables of all Kinds, while growing, emit Particles, which float in the Air, and which are either healthful, or noxious to human Bodies, according to their different Virtues. Mr. *Boyle* ſays (*x*), that the *Dutch* having agreed with the King (to whom the Iſland of *Ternate* belong'd) to fell almoſt all the Clove Trees that grew there, in order to raiſe the Value of that Spice: Such a Change of the Tempera-

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(*u*) Chem. *Boerhaave*, Vol. 2. Proceſs 1.
(*w*) *Hale*'s Veg. Stat. pag. 49, 50. Exper. 17.
(*x*) Hiſtor, of Air,

ture of the Air enſued thereupon, as ſhew'd the Exhalations of the Clove Trees preſerv'd the Health of the Inhabitants; for ſoon after theſe Trees were cut down, the whole Iſland became exceeding ſickly, which may be imputed to the corroſive and noxious Steams of a Vulcano there, the ill Effects of which, were formerly prevented by the aromatic Effluvia of thoſe Spicy Trees.

Bonetus ſays (*y*), that ſitting, or lying, under a Walnut, or Elder Tree, will cauſe a Pain in the Head, Vertigo's, Epilepſies, and Apoplexies; and that (*z*) the Effluvia of the Taxus and Oleander Tree are often fatal in the ſame Way: And alſo (*a*) the Flavour of the Flowers of Beans in the common Fields, is apt to bring a Relapſe in thoſe Perſons who are ſubject to Madneſs. *Etmuller* tells us of a Perſon trading in Saffron, who, for the ſake of ſaving ſome Duty, conceal'd a Bag

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(*y*) *Theſaur.* Vol. 3. pag. 568, 573.
(*z*) *Ibid.* pag. 581.
(*a*) *Ibid.* pag. 582.

Bag of Saffron ſo long under his Cloths, that it's Effluvia kill'd him. *Petrus Borellus*, in his Obſervations (*b*), mentions a Perſon, who being us'd to live and ſleep near a great Quantity of Saffron, was at laſt ſo afflicted with a violent Pain in the Head, that he died. He ſays, he has heard, that Horſes carrying Loads of Saffron, were ſo affected with it, as to piſs Blood.

Some Kind of Vegetables are aceſcent, others are alcaleſcent; the firſt Sort, when cut down from the Roots, will, by fermenting, ſoon ſet looſe their moſt vinous Spirits, Salts, and Oils (*c*); the latter, by putrefying, ſet at Liberty their moſt acrid, volatile Parts; as we ſee daily near great Gardens, where there are many Cabbages, Cauliflowers, Muſtard Stalks, *&c.* thrown out on Heaps, which ſtink as ill as any putrify'd Carcaſe. Hence the Atmoſphere is fill'd with the Spirits, Salts, and Oils of all Kinds of Vegetables.

All

(*b*) Obſervat. 35. Cent. 4. pag. 305.

(*c*) Chem. *Boerhaav.* Vol. 1. pag. 484, 485.

All Kinds of Vegetable Fewel in burning, ſends all it's component Parts into, and mixes with the Air, except the Aſhes and the fix'd Salt: Lord *Bacon* (*d*) gives us an odd Account of the Effects of ſuch Things burnt in the Air, tho' at a great Diſtance; for he ſays, *Traditur, apud nos in Anglia temporibus, cum Gaſconia eſſet hujus ditionis, exhibitum fuiſſe regi libellum ſupplicem, per ſubditos ſuos Burdgaliæ, & confinium; petendo ut prohiberetur incenſio Ericæ in agris Suſſexiæ, & Hamptoniæ, quia gigneret ventum circa finem Aprilis vineis ſuis exitiabilem.* Sailors can often tell they are not far from Land (when they are not able to ſee the Shoar) by the Flavours they ſmell.

How the Air is affected by the Effluvia from Animals.

§ 6. Animals, whether living or dead, contribute very much towards clogging the Air with the moſt noxious Particles; for all their Parts, by Putrifaction, ſoon become volatile and acrimonious; this Sort of Air is the moſt unwholeſome and dange-

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(*d*) Hiſtor. Ventor. pag. 57.

dangerous, as we find by Experience: For the Inhabitants of thoſe Countries, where ſeveral hundred Men have been ſlain in Battle, and left unburied, have ſoon after been violently afflicted with putrid Fevers, almoſt as pernicious as the Plague, and ſometimes the Plague it ſelf; an Inſtance of which *Auguſtinus* gives us (*e*), which happened at *Maſſaniſſa*, wherein 80000 Perſons died; and at *Utica*, wherein 30000 Perſons died of that Plague. *Livy* (*f*) mentions another Plague, which over-ran a great Part of *Italy*, and ow'd it's Riſe to the dead Bodies of the *Romans* and *Fidenates* left unburied in the Field. That Plague in *Germany* in 1630 ſprung from the ſame Cauſe; as alſo that mentioned by *Ambroſius Paræus*, 1562 (*g*); and another was occaſioned by great Quantities of Locuſts, driven by the Winds into the Sea, and thence, by the Waves, caſt up in Heaps on the Shoar, where they putrefy'd, as *Diodorus Siculus* informs us; hence we ſee

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(*e*) Lib. 3. de Civit. Dei, cap. 31. Sennert. de Peſte, lib. 4. cap. 2. pag. 386.

(*f*) Hiſtor. Roman.

(*g*) Opera. Lib. 21. de Peſte.

ſee a very ſubſtantial Reaſon for obliging all Perſons to bury their dead Cattle, *&c.*

The Atmoſphere abounds with the Perſpirations of all Animals, as well as with the Effluvia of all their other Excrements; all which, are no leſs pernicious than the Effluvia from the above-mention'd Things. Human Perſpiration, by Mr. *Hales*, (*h*) is computed at $\frac{1}{50}$ Part of an Inch in 24 Hours; and the Quantity of Moiſture, by Reſpiration from the Lungs, he computes at 9792 Grains, or 1. 39. in 24 Hours (*i*); the Surface of the Body he computes at 2160 ſquare Inches, or 15 ſquare Feet: And Dr. *Langriſh* ſays (*k*), the Effluvia of human Bodies are extremely corruptible; and leſs than 3000 Creatures, living within the Compaſs of an Acre of Ground, would make an Atmoſphere of their own Steams, about 71 Feet high, in 34 Days; which, if not diſperſed by Winds, would turn peſtiferous in a Moment; from whence

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(*h*) Veget. Stat. pag. 11. cap. 1. exp. 1.

(*i*) Hæmaſt. pag. 326. ſect. 5. pag. 328. ſect. 7.

(*k*) Mod. Theor. and Pract. of Phyſic, pag. 354.

we may infer, that living in great and populous Cities, or in Camps, or near a Number of dead Carcaſſes, may diſpoſe the Air and human Bodies to putrid and malignant Fevers; which is prov'd by Experience; for the Plague, which broke out at *Athens* (*l*), *Anno Mundi* 3574, was greatly increas'd, if not cauſed, by the crowding and keeping ſo many Country People in a Town; in that they were forc'd, now in the Heat of Summer, to dwell many of them together idle, in little Tenements and ſultry Hovels (the Country at that Time being ravag'd by *Archidamus*) when, as before, they liv'd in a pure, open, and free Air. And that Plague at *Rome*, *Anno Urb. Condit.* 291, mention'd by *Livy*, was increas'd by the ſame Means (*m*).

Great

(*l*) Plutarch. Vit. Peric. pag. 565. *Rollin*'s Ancient Hiſt. Vol. 3. pag. 351. *Thucydid.* Lib. 2. pag. 130, 147. *Diod. Sicul.* pag. 101, 102. *Hippoc.* Epid. Lib. 3. Sect. 3.

(*m*) Hiſt. Roman. Decad. 1. Lib. 3. pag. 158. Grave tempus, & forte annus peſtilens erat urbi agriſque, nec hominibus magis quam pecori; & auxere vim morbi terrores populationis, pecoribus agreſtibuſque in urbe acceptis, ea colluvio miſtorum, omnis generis animantium, & odore inſolito urbanos, & agreſtem confortum in arcta tecta æſtu ac vigiliis augebat.

Great Care ought to be taken, to prevent the opening of old Burying Places, eſpecially thoſe, wherein they who died of the Plague were interr'd; for we find a fatal Inſtance of it in *Ammianus Marcellinus* (*n*): *Milites fanum ſenitantes invenere foramen anguſtum: quo reſerato ut pretioſum aliquid invenirent, ex adyto quodam concluſo a Chaldeorum arcanis labes primordialis exiliit, quæ inſanabilium vi concepta morborum, ejuſdem Veri Marcique Antonini temporibus ab ipſis Perſarum finibus, aduſque Rhenum & Gallias cuncta contagiis polluebat & mortibus.* In this Temple of *Apollo*, at *Seleucia*, it was ſuppoſed they had buried their Soldiers.

How the Air is affected by the Ova of Inſects floating in it, and in Water.

§ 7. The Ova of Inſects, nay, and ſometimes Inſects themſelves, which are continually floating in the Air, and are ſo ſmall, as to be inviſible, even by the Aſſiſtance of the beſt Microſcopes, render the Air unwholeſome; this is an Inconvenience, which almoſt conſtantly attends

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(*n*) Hiſt. Lib. 23. pag. 251. Riolanus Method. Medend. Cap. 19. Lib. 2. Schenk. Obſerv. Lib. 7. Obſerv. 1.

tends marſhy Grounds, where we always find great Quantities of Flies and Inſects, which, as *Varro* ſays (*o*), are ſucked in with our Breath, and ſwallow'd with our Food; whence proceed bad and obſtinate Diſeaſes. Whether this be really ſo, I ſhall not diſpute; but the frequent cutaneous Eruptions in theſe Places, many of which contain Worms exceeding ſmall, render it not altogether improbable: For the numerous Ova of theſe, and other Inſects, are latent in their Food, and Drinks; which, in weak Digeſtions, not being deſtroy'd, will paſs farther into the Body than the Primæ Viæ; where, meeting with a proper Nidus, various Animals will be produc'd; which, by getting into the ſmall Veſſels, will there cauſe Obſtructions, Inflammations, Fevers, *&c.* Worms and Maggots in Tumors and Ulcers, as in that Girl at *York*, mentioned by Dr. *Liſter* (*p*); the Long Worm of the *Eaſt Indians*, occaſioned by the Water betwixt *Gomron* and *Schiraz*, eſpecially about *Laur*, ſix or ſeven

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(*o*) Terent. Varro de Ruſtic. Lib. 1. Cap. 12.

(*p*) Philoſ. Tranſ. Numb. 95. pag. 60, 64.

ſeven Yards long (*q*); as alſo at *Bander-Congo*, and *Bander-Abaſſi* (*r*). In *Perſia* the Worms are like Fiddle-ſtrings, 20 or 30 Spans long, which are bred in the Muſcles of the Body: They are imputed to the bad Water, which is kept in Ciſterns; for, during the Winter, it only rains three or four times, and not above an Hour or two at a time; and even then the Air is foul, becauſe of the many Exhalations, which are conſtantly ariſing. At *Jalofes* and *Foules* (*s*), in *North Guinea*, the Worms in the Fleſh are four or five Feet long; and on the Coaſt of *South Guinea* (*t*), the Worms are called *Ikkon*, of about an Ell and Half long, and as thick as a Raven's Quill, as Mr. *Barbot* was an Eye-witneſs of, in one of the Slaves on board their Ship. The Inhabitants are forced to drink Pit Water, eſpecially thoſe of *Ormus*, *Monree*, and *Cormintin*,

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(*q*) Philoſ. Tranſ. Numb. 225. pag. 417.

(*r*) Dr. *John Francis Gemelli Careri*'s Voyage round the World, Part 2. pag. 171. Lib. 3. Cap. 2.

(*s*) *John Barbot*'s Deſcription of *Nigritia*, or *North Guinea*, pag. 32. Lib. 1. Cap. 2.

(*t*) *Barbot*'s Deſcription of *South Guinea*, Lib. 3. Cap. 22. pag. 278, 279.

Cormentin, who are afflicted with this Worm-diſtemper more than in any other Parts of this Coaſt: But yet, what more contributes to their Increaſe, beſides the ill Food and bad Water, are the exceſſive and malignant Rains and Mil-dews of the cool Evenings; for they are more afflicted with this Diſtemper in the rainy Month of *Auguſt*, than in any other, the Rain being then ſo corroſive, as to rot woollen Cloth in three Days, if not prevented by drying at the Fire immediately, which the above-mentioned Author himſelf obſerv'd: Such a Sort of Rain as this, was that mention'd in *Act. Lip.* (*u*); for the Drops were very large, and, if they fell upon the Skin, they corroded it; if upon the Cloths, there ſoon appear'd little creeping Worms. At *Sierra Leona* (*w*) in *Guinea*, the Inhabitants are forc'd to keep within their Huts, during the Rain in *June* and *July*, which in an Inſtant breeds Maggots; it being alſo at that Time exceſſive hot.

(*u*) Act. Lipſ. Suppl. Tom. 1. pag. 425.

(*w*) *Barbot*'s Deſcription of *Sierra Leona*, Lib. 2. Cap. 2. pag. 102. and Act. Lipſ. Tom. 1. pag. 425.

Mr. *Thomas Henſhaw* (*x*) obſerv'd, that ſeveral Kinds of Inſects bred in *May*-Dew, ſome are like *Millepedes*, *ſome like ſmall Flies, with large Wings, ſuch as are uſually ſeen in Swarms in a Summer's Evening; and others were at firſt like Tad poles, but much leſs, with great Heads, and ſmall tapering Bodies, and which ſoon chang'd into Gnats, leaving their empty Skins floating on the Surface of the Dew.* All theſe Ova exiſted in the *May*-Dew, and yet were inviſible: We often ſee, when the Leaves of Trees are clammy, great Numbers of very minute Animals, every Day increaſing in Bulk, which muſt be from the Ova floating in the Air, and which, adhering to theſe clammy Leaves, find there a proper Nidus.

How the Air is affected by Mineral Exhalations.

§ 8. Now let us proceed to the Foſſil and Mineral Exhalations. The Generality of theſe are much more pernicious to Mankind, than either of the Sorts above-

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(*x*) Philoſ. Tranſ. Abridg. Vol. 2. pag. 142.

above-mention'd: For both *Mezeray* (*y*) and *Boyle* (*z*) ſay, that the Plague, which was ſo very fatal in the Year 1346, begun two Years before in the Kingdom of *Cathay*, by a Vapour moſt horribly fœtid, which broke out of the Earth, like a ſubterraneal Fire, and conſum'd the whole Country for above 200 Leagues, and infected the Air in a wonderful manner: From *Cathay* it paſſed into *Aſia*, *Greece*, *Africa*, and afterwards through all *Europe*. *Petrus Borellus* (*a*) ſays, that before the Plague broke out in 1629, they obſerv'd darkiſh Clouds in the Mornings and Evenings; which, after Sun-riſe, diſappear'd 'till after Sun-ſet, and then appear'd again. *Daubigne* ſays (*b*), the ſame was obſerv'd at *Beavais*, in *France*, before that Plague broke out. And *Riverius* ſays (*c*), that a Comet appear'd in the Eaſt about *November* 27,

1681,

(*y*) Hiſtoire de France.

(*z*) Treatiſe of the Salubrity and Inſalubrity of the Air, Prop. 8. pag. 69.

(*a*) Obſerv. 21. Cent. 1. pag. 27.

(*b*) Hiſt. Franc. Cap. 2. Tom. 3. *Pet. Borell.* Obſerv. 21. Cent. 1. pag. 27.

(*c*) Lib. de Feb. Peſt. Cap. 1. pag. 448.

1681, and was the Fore-runner of peſtilential Diſeaſes.

Theſe Fumes, or Vapours, come out of the Ventiducts, Paſſages, or Clefs, in particular Grounds; one of which Dr. *Tancred Robinſon* (*d*) mentions in *Peroul*, near *Montpelier*, at the boiling Fountain; where he ſaw thoſe little Paſſages, out of which the Steams iſſued.

Some of theſe Fumes are hot, and ſome will flame upon applying a Candle to 'em; as that near *Wigan* in *Lancaſhire*; one near *Grenoble* in *Dauphine*; another near *Hemanſtadt* in *Franconia*; another at *Chermay* in *Switzerland*; another not far from *Cracovia* in *Poland*.

Dr. *St. Clair* ſays (*e*), that on a Side of one of the *Appennine* Mountains, half way betwixt *Bologne* and *Florence*, near a Place call'd *Petra Mala*, about five Miles from *Fierenzola*, there is a Spot of Ground three or four Miles in Diameter, which

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(*d*) Philoſ. Tranſ. Vol. 2. pag. 349.
(*e*) *Ibid.* Vol. 2. pag. 385.

which inceſſantly ſends up a Flame, riſing very high, without Noiſe, Smoak, or Smell, yet is very hot; and is always ſo, except in great Rains, which put it out for a ſmall Time; but as ſoon as the Rains are over, it burns with greater Vigour and Heat than before. Mr. *Maurice Jones* (*f*) mentions juſt ſuch another at *Harleck* in *Merionethſhire*, that ſpoil'd all their Graſs, and burnt their Hay; and that in the Neighbourhood there are three ſmall Tenements, call'd *Tydhin*, *Sion*, *Wynn*, where the Graſs is ſo infected, that it abſolutely kills all manner of Cattle that feed on it.

Damps, Fumes, or Vapours, are very rife in Countries where there are many Mines of any Kind whatſoever, thereby occaſioning Thunder, Lightening, Storms, and nocturnal, fiery Meteors, more frequently than in other Places, as Mr. *Joſeph Glanvil* ſays (*g*), in his Account of the Lead Mines in *Somerſetſhire*. He alſo obſerv'd, that where the Veins of the

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(*f*) Philoſ. Tranſ. Vol. 2. pag. 101.
(*g*) *Ibid.* Vol. 2. pag. 385.

the Mines came near the Surface of the Ground, there the Graſs was yellow and diſcolour'd. At *Fachlun* in *Sweden*, noted for one of the beſt Copper-Mines in that Kingdom, the mineral Exhalations affect the Air ſo much, that their Silver Coin is frequently diſcolour'd; nay, ſometime turn'd black, tho' cloſe tied up in Bags. *Boyle* ſays (*h*), he obſerv'd that the Trees and Herbs grow and thrive much better in the Weſtern Parts of *England*, where the Tin-Mines are, than in any other Soil in the Neighbourhood; and it is alſo a common Obſervation, that the Tin-Miners live long, and are healthy. He alſo obſerv'd (*i*), that in riding over Soils, wherein there are Beds of Minerals and Foſſils of various Kinds, as they croſs'd their Veins, or Beds, they found in ſome offenſive, in others pleaſant and agreeable Smells. I believe there are few, who have not frequently obſerv'd thick Fogs ariſing in Veins, or Lines, in one Part of a Field, while the other is ſerene

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(*h*) Treatiſe on the Cauſes of the Salubrity and Inſalubrity of the Air, Prop. 1. pag. 6.

(*i*) *Ibid.* pag. 11.

ſerene and clear; and alſo that theſe Fogs have various Kinds of Odours, according to the Place whence they aroſe: Thoſe (as we obſerv'd above) from Tin-Mines, are wholſome; and the Steams from a Mine in *Hungary*, where they get an Oar call'd *Rot Gulden erts*, are ſo refreſhing, that People chooſe to enjoy 'em in taking the Air; but thoſe from moſt other Places are unwholſome, and are thereby the Cauſes of many Diſeaſes; which is ſufficiently prov'd, by what happens to the Miners, and Workers of what comes out of the Mines; *ex. gr.* Mercurial Vapours induce Tremors, Gripings, Vertigo's, Aſthma's, Palſies, and Hectics (*k*): The Miners, Dr. *Walter Pope* tells us (*l*), can't well ſtay under Ground above ſix Hours at one time: And *Fallopius* obſerv'd (*m*), they ſcarce ever outliv'd three Years, moſtly dying paralytic and hectic. The above-mention'd Dr.

(*k*) *Wainwrigh.* Non-nat. pag, 82. Schenkii. Obſerv. Med. Lib. 7. pag. 891. De Venenis ex Foſſilibus & Metallicis. Obſerv. 2, 3, 4, 5, 6. Hornung. Ciſt. Med. Epiſt. 125. Fol. 280. Fernelius, Cap. 7. de Lue Venerea. Ramazani de Morb. Artif. Cap. 1. pag, 277. Cap. 2. pag. 282. Cap. 3. pag. 285.

(*l*) Philoſ. Tranſ. Vol. 2. pag. 579.

(*m*) Tract. de Metall. & Foſſil.

Pope ſays, he ſaw a Man, who had not been in the Mines for above half a Year before, yet was ſo full of Mercury, that holding a Piece of Braſs in his Mouth, or rubbing it betwixt his Fingers, it immediately became as white, as if it was rubb'd with Mercury it ſelf.

Lead Miners, and Workers of the Oar, are ſubject to Pains in the Stomach, with exceeding Contortions of the Guts, and Coſtiveneſs, that yields not to Cathartics, hardly to often repeated Glyſters, but beſt to Lenitives: They are alſo ſubject to acute Fevers, Aſthma's, Vertigo's, great Pains in the Brows, Blindneſs, Want of Appetite, and frequent Vomitings; moſt Miners of the metalline Oar are ſubject to Dyſpnæas, Phthiſes, Apoplexies, Obſtructions, Incubus, hypochondriac and melancholic Diſeaſes, Ulcers (*n*) in the Gums and Skin, and falling out of the Teeth, *&c.* Fumes of Coal, Sulphur, and bitumi-

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(*n*) Ramaz. de Morb. Artif. Cap. 1. pag. 277. Baglivi. Prax. Med. Lib. 1. Cap. 15. Sect. 3. pag. 142.

bituminous Bodies (*o*), cauſe Suffocations, Aſthma's, Hypochondriacs, *&c.* The Vapours of Coal-pits (eſpecially upon opening an old one) are very fatal, ſcarce giving Warning, excepting that ſometimes the Miners can perceive the Flame of their Candles to change to a blue Colour, a few Seconds before the Fumes burſt into open Flames, which is only one Flaſh, and kills inſtantly (*p*): I have ſeen two or three of theſe unfortunate Miners a few Hours after they were kill'd, ſome of which ſeem'd to have no external Injury; others ſenſibly burnt, both in their Cloths and Bodies. Hence we ſee, from what has been ſaid, that a manifold Variety of Exhalations are prepar'd in, and conſtantly flying out, from the ſeveral Reconditories below, cauſing various Kinds of Epidemics, and the Plague itſelf; which is ſtill farther confirm'd, in that they generally ſucceed Earthquakes, as *J. a' Felde* and many others

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(*o*) Joan. Caius, Lib. de Ephem. Brittan. Plin. Nat. Hiſt. Lib. 31. Cap. 3. Philoſ. Tranſ. Numb. 3. pag. 44. Numb. 48. Numb. 117. pag. 392. Numb. 136. pag. 895.

(*p*) Anton. Guaineras de Peſte, Cap. 1.

others obſerv'd (*q*); and a ſort of Plague was cauſed by a ſubterraneous Fire, reaching from Port (*r*) *Santorini* to *Chio* and *Smyrna*; *Santorini* was by this means ſo infected, that abundance of People were kill'd, and many loſt their Sight there, though they recover'd it in a few Days afterwards: And at *Chio* and *Smyrna* all the Coin was changed red, as well that lock'd up in Cheſts, as that in their Pockets. Some of thoſe Vapours are cold, as thoſe near *Peroul*, and in the Caverns of Mountains; eſpecially thoſe of *Æolus*, and other Hills in *Italy:* And Lord *Bacon* ſays (*s*), *Notavit Acoſta, Oppida Platæ & Potoſæ in Peruvia, non longe eſſe diſtantia, & utrumque ſitum eſſe, in terra elevata aut montana, ut in hoc differant; & nihilominus habere Potoſam temperaturam aeris frigidam & hyemalem, Platam clementem & vernam: id quod videtur argenti fodinis juxta Potoſam attribui poſſe; quod demonſtrat eſſe ſpiracula terræ, quatenus ad calidum & frigidum:*

(*q*) Tract. de Peſte, pag. 103.
(*r*) Voyage to the *Levant.*
(*s*) Hiſt. Ventor. pag. 40.

frigidum: Other Vapours are inflammable, and actually warm, as thoſe near *Wigan*; others are ſulphureous, as thoſe from the Vulcano's near *Naples*, *Bajæ*, and *Puzzuola*, &c. others are arſenical, as in the Grotto *Del Cani*, in ſome Mines in *Carniola*, *Campania*, &c. and at the *Cape of Good Hope*.

I know there are ſome Perſons, who will not believe, that foſſil and mineral Particles can be made ſo volatile, as to aſcend into Air, by any Heat no greater than that of the Sun on our Globe; but Chemiſtry proves they do by many Inſtances (*t*); for we find that Sulphur will not only riſe it ſelf, but alſo take along with it other Particles; as will alſo Mercury; we know alſo that there are, and we daily meet with ſuffocating Fumes in Ditches, which will burn with a Candle; nay, we have an Inſtance of a ſulphureous Rain with Thunder, which burnt, and could not be extinguiſhed, either by Water, or Motion (*u*): And *Boerhaave*

(*t*) Boerhaav. Chem. Vol. 1. pag. 492.

(*u*) Nov. Literar. Anno, 1684. pag. 63.

Boerhaave ſays (*w*), *Ros ſane in certa telluris plaga collectus, deſtillando liquorem dedit, qui vitro colorem penetrabilem iridis impreſſit, nec aqua ſtygia, nec lixivio alcalino, nec frictione delebilem; ipſeque hic liquor inflammabatur inſtar ſpiritus vini, ut in experimentis chemicis recitatis* (*x*). *Ros iterum deſtillatus, octiduo leni tepore digeſtus, iterata deſtillatione ſexies ſubtilior reditus, tria dicitur vaſa vitrea fregiſſe, inſipidus permanſiſſe prorſus, licet quam maxime tenuis meros ſpiritus referret* (*y*).

And Mr. *Robert Vaus* tells us (*z*), that at *Tipperary*, *Limerick*, and *Kilkenny*, *November* 16, 1695, they had Showers of a ſort of Matter like Butter, or Greaſe, which, if rubb'd upon the Hand, would melt, but, if laid by the Fire, would dry and grow hard, having a very ſtinking Smell; it was ſoft, clammy, and of a dark yellow Colour; always fell in the Night, and chiefly in mooriſh, low Lands;

(*w*) Chem. Vol. 1. pag. 471.
(*x*) Literar. Tom. 1. pag. 590.
(*y*) *Ibid.* Anno 1708, pag. 152.
(*z*) Philoſ. Tranſ. Vol. 2. pag. 143.

Lands; 'twas ſeldom obſerv'd in the ſame Place twice; moſt of that Seaſon they had ſtinking Fogs. Theſe Fumes are not rais'd, as ſome imagine, by the Heat of the Sun alone, but alſo by ſubteraneous Fires, Frictions, Mixtures, *&c.* which is confirm'd by Labourers in deep Mines, who ſay, that when they deſcend only a few Fathoms, they find themſelves much colder; afterwards, as they deſcend lower, the Heat increaſeth, inſomuch that they are forc'd to work without their Cloths. Mounſieur *Le Givre*, ſays (*a*), in digging he has often found the mineral Fluid drilling through ſmall Conduits, and about the Conſiſtence of Oil; he alſo tells us the various Degrees of Conſiſtence and Solidity, according to it's being more or leſs expos'd to the Air: I doubt not, but as this Fluid grows of a thicker Conſiſtence, all the moſt volatile Parts evaporate with the Water.

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(*a*) Memoir. de L' Acad. des Scienc. 1704, 1705, 1706. Boerhaav. Chem. Vol. 1. pag. 617.

There are alſo ſaline Particles in the Air, and which help to diſſolve Metals, as we ſee in old Window-Bars, which waſte and decay in Time; and at *Bermuda* the Tops, or Coverings, of the Houſes are decay'd, as well as Metals, by the corroding Quality in the Air (*b*).

At what Seaſon of the Year the Air is fill'd with moſt ſalubrious, or inſalubrious Particles.

§ 9. The Air thus abounding with ſuch a Diverſity of Effluvia and Exhalations, affects our Bodies, according to the various Natures and Qualities of ſuch as are moſt predominant; which are ſomewhat different, according to the different Seaſons of the Year: Thus, *ex. gr.* in the Spring, the Air being impregnated with the ſalubrious, aromatic Effluvia of the opening Flowers and Spring Plants, will be more vivifying and refreſhing, than the Autumnal Air, which is loaded with noxious Steams of putrefying Vegetables; which, unleſs quickly diſpers'd by Winds, moſt frequent at that Seaſon, would ſoon produce very miſchievous Effects.

§ 10. There

(*b*) Boerh. Chem. pag. 494. Vol. 1.

The vivifying Spirit of Air.

§ 10. There is ſomething in the Air, which is neceſſary to preſerve Life and Health; for Air not only cools and dilates the Lungs, whereby it intimately mixes the Blood, but alſo ſupplies the Blood with ſomething, without which, Life can no longer exiſt, and without which Fire goes out; hence it is by ſome call'd, a vivifying Spirit, by others, Nitro-Aerial Particles: But, be it what it will, every time the Air paſſes out of the Lungs of an Animal, part of this vivifying Spirit is either deſtroy'd, or left behind; for an Animal will die, as well for want of freſh Air, as for want of Air it ſelf (*c*); for Mr. *Hales* ſays (*d*), two Gallons of Air will, in two Minutes and a Half, become unfit for Reſpiration; and in another Place he ſays (*e*), that 74 cubic Inches of Air would ſcarce laſt him a Minute, for the Elaſticity of the Air is thereby in a great meaſure weaken'd,

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(*c*) Philoſ. Tranſ. Abridg. Vol. 2. pag. 230, 234. and *Hauxbee*'s Experiments.

(*d*) Hæmaſt. Vol. 2. pag. 324. Exper. 6. Sect. 3.

(*e*) *Hale*'s Static Eſſays, Vol. 1. Exper. 108. pag. 238.

weaken'd, as well as the vivifying Spirit (*f*); hence we ſee one Reaſon of fainting often in very hot Weather, and Briskneſs in froſty Weather.

All Vapours whatſoever incommode Reſpiration proportionably; ſome of which not only contract the Lungs, but alſo weaken the Air's Elaſticity; which it will in a great meaſure regain, by having thoſe Vapours diſpell'd by the ventilating Motion of the free, open Air, which is render'd wholſome by the Agitation of the Winds; thus what we call a cloſe, warm Air, ſuch as has been long confin'd in a Room, without having the Vapours carried off by communicating with the open Air, is apt to give us more or leſs Uneaſineſs, in Proportion to the Quantity of Vapours, which are floating in it; thus many of thoſe who have weak Lungs, but can breath well enough in freſh Country Air, are greatly incommoded in their Breathing, when they come into large Cities, where the Air is full

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(*f*) Verulam. Hiſt. Vitæ & Mortis Connex. ad Aritcul. 15. pag. 389.

full of fuliginous Vapours, ariſing from innumerable Coal-fires, and Stenches from filthy Lay-ſtalls and Sewers; and even the moſt robuſt and healthy, in changing from a City to a Country Air, find an exhilerating Pleaſure, ariſing from a more free and kindly Inſpiration, whereby the Lungs being leſs loaded with a clogg'd Air, and Vapours; and alſo the Veſicles being more dilated with a clearer and more elaſtic Air, a freer Courſe is thereby given to the Blood; and this is one Reaſon why in the Country a ſerene, dry Conſtitution of Air is more exhilerating, than a moiſt thick Air.

When we reflect on the great Quantity of elaſtic Air, which is weaken'd by ſulphureous Fumes, it ſeems not in the leaſt improbable, that when an Animal is kill'd by Lightening, without any viſible Wound, that it may be done by the Air's Elaſticity being inſtantly deſtroy'd by ſulphureous Lightening near the Animal, whereby the Lungs will fall flat, and cauſe ſudden Death; which is farther confirm'd by the Flatneſs of the Lungs of ſuch Animals, their Veſicles being found, upon Diſſection, to be fallen flat, and to have no Air in them; the burſting alſo of Glaſs Windows outwards, ſeems to be from the ſame Effect; the certain Death, which comes on the Exploſion of the Vapours in Mines, ſeems to be effected in the ſame Manner; for tho' at firſt there is a great Expanſion of the Air, which muſt dilate the Lungs, yet that Air is no ſooner fill'd with fuliginous Vapours, but a great Part of its Elaſticity is immediately weaken'd; which Steams have, doubtleſs, the ſame Effect on the Air in the Lungs of Animals, as thoſe in the *Grotto del Cani*, or when a cloſe Room is fill'd with them, where they certainly ſuffocate: Hence we ſee the Folly of ſome, who are for almoſt ſtoving up their Patients in cloſe Beds, the Curtains being drawn cloſe, as well as the Doors and Windows ſhut; nay, and perhaps a great Fire in the Room at the ſame time, more eſpecially in the Small Pox, a Practice too frequent with many.

We know alſo by Experience, that even fragrant Smells will ſo affect ſome hyſterical Women, as to throw them into a Syncope: And there is no Conſtitution which ſome Smell or other will not diſorder; and what a ſtrong Smell will do ſuddenly, a faint one may do in Time: And, though Cuſtom may abate the Senſe of it, as in Tallow-Chandlers, Leather-Sellers, and Tanners; yet, by Degrees, it will operate effectually, to produce a Change in the Conſtitution, either for the better, or the worſe, according to the different Subjects it hath to work on; hence Diſtempers are more frequent and dangerous in Cities, than in the Country; and the great Mortality, that is ſo often in Camps, as has been before obſerv'd in § 6. is commonly owing to the ſame Cauſe: Hence we ſee the Reaſon of this Caution given to the *Jews* (g); *Thou ſhalt have a Place alſo without the Camp, whither thou ſhalt go forth abroad, and thou ſhall have a Paddle upon thy Weapon,*

(g) *Deuteronomy*, Cap. 23. Ver. 12, 13.

pon, and it ſhall be, when thou wilt eaſe thy ſelf abroad, thou ſhalt dig therewith, and ſhalt turn thee back, and cover that which cometh from thee.

The Effects of the various Temperatures of the Air. 1ſt. of Hot.

§ 11. Let us now proceed to conſider the Effects of the various Changes of the State or Temperature of the Air, whoſe Rarety makes it more liable to the Changes of Heat and Cold, than any other Fluid.

The Air, or Atmoſphere, affects us, either as it is too hot, or too cold, too wet, or too dry, too heavy, or too light.

The Heat of Air near the Earth, in ſome Meaſure, depends on the Surface of the Earth, which in ſome Places retains Heat, more than in others: Black Earth imbibes the Sun's Rays; white, reflects 'em; hence black Earth is warmer, but the Air above it colder; and the white Earth is colder, but the Air above it warmer, by the Reflection of the Sun's Rays. *Boyle* (*b*) tells us, that in riding over

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(*b*) Account of *Teneriff*.

over a Bed of Sand on the Side of Mount *Teneriff*, he found it ſo heated by the Reflection of the Sun's Beams from the Rocks above, that it burnt the Feet of a Dog as he paſſed over it, tho' in every other Part of the Mountain, they and their Horſes were almoſt ſtarv'd with Cold. The Heat of the Iſland *Ormus*, which lies beyond the Tropick of *Cancer*, is ſo intolerable at ſome Time of the Day, by the Reflection of the Sun's Beams from the white Mountains of Salt, that the Inhabitants are forc'd to immerge themſelves in Water. The Air is alſo heated by the Fermentation of the various Kinds of Exhalations that ariſe out of the Earth, as may be plainly demonſtrated, by only mixing ſulphureous, aqueous, and chalybeate Particles: May we not then, and with good Reaſon, conclude, that the irkſome Heat which we feel, in a cloſe, ſultry Temperature of Air, is occaſion'd by the inteſtine Motion of ſuch like Vapours, when there is no Wind to diſperſe them? I think the common Obſervation, that Lightening cools the Air, confirms it, that being the utmoſt and laſt Effort of the Efferveſcence. What yet confirms me the more in that Opinion, is the Warmth of the Earth at ſome Depth under Ground (which is occaſioned by ſome ſuch Vapours fermenting there) has ſo great an Influence in promoting a Thaw, as well as the Change of the Weather from a freezing, to a thawing State; as is manifeſt from this Obſervation of Mr. *Hale's* (*i*), *viz.* " *November* 29, 1731, a little Snow having fallen in the Night, it was by 11 o'Clock next Morning moſtly melted away on the Surface of the Ground, except in ſeveral Places in *Buſhy Park*, where there were Drains dug and cover'd with Earth, where the Snow continu'd to lay, whether theſe Drains were full of Water, or dry, as alſo where Elm Pipes lay under Ground; a plain Proof that theſe Drains intercepted the Warmth of the Earth, from aſcending from greater Depths below them; for the Snow lay where Drains had more than four Feet Depth of Earth over 'em: It continu'd alſo to lay on Thatch, Tiles, and

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(*i*) Hæmaſtat. pag. 360. Appen. Obſervat. 13.

and on the Tops of Walls." And the ſame I obſerv'd the laſt Winter, in ſome Grounds in our Neighbourhood, wherein there are ſeveral Drains and Soughs from Coal Mines. And we obſerved before, that Miners were often forc'd to work without Cloths.

Heat, but yet not ſo great as to deſtroy Animal Solids, rarifies the Humours and weakens the Fibres; whence proceeds the Senſation of Faintneſs and Debility; and whence languid and hyſteric People ſuffer many Inconveniences in a hot Day; the Fluids are expanded, as is evident to the Sight and Touch, for the external Veſſels are plumper in hot than in cold Weather; the Quantity of Perſpiration, both ſenſible and inſenſible, is, *cæteris paribus*, greater or leſs, according to the different Degrees of Heat, as *Sanctorius* ſhews us (*k*): Hence the thinner Parts of the Blood are waſted; whence Obſtructions in the ſmall Glands and Capillary Veſſels, Inflammations, Thirſts, Stran-

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(*k*) Sanct. Med. Stat. Aph. 2, & 41. Sect. 2.

Stranguries, hot and red Urine, divers acute Diſtempers, bilioſe Fevers, and Cholera Morbus, continual and ardent Fevers (*l*), attended with Hæmorrhages, bilioſe Vomitings, and Looſeneſſes, and alſo Plagues (*m*): Hence Inhabitants of hot Countries ſhould uſe moſt commonly cooling, ſubaſtringent, diluting Diet, and frequently uſe cold Bathing. Dr. *Boerhaave* (*n*) relates the remarkable ill Effects of breathing in a very hot Air; for he put a Sparrow into a Sugar-Baker's drying Stove (the Heat of which was ſo great, as to raiſe the Mercury in *Farenheit*'s Thermometer to 146 Degrees; that is 48 more than the natural healthy Heat of the Blood in a Child) he put, I ſay, a Sparrow into it, which, in about a Minute and half, expreſs'd a great Uneaſineſs, and died in ſeven Minutes. A Cat alſo being put in, expreſs'd a great Uneaſineſs in a Minute, and died in about ſixteen Minutes: It was as wet with Sweat,

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(*l*) *Wintringham.* Noſolog. Com. pag. 32.

(*m*) Livy. An. Urb. cond. 363. pag. 348.——Peſtilentiamque ex Agro Romano ex ſiccitate caloribuſque nimiis ortam.

(*n*) Element. Chem. Vol. 1. pag. 175.

Sweat, as if it had been dipt in Water. A Dog being put in, begun to pant much for Breath in ſeven Minutes, and in a Quarter of an Hour expreſs'd very great Uneaſineſs; ſoon after which he grew faint, and died in twenty-eight Minutes; he drivell'd all the Time, a great Quantity of red Foam (*o*), which ſtunk ſo intolerably, that a ſtrong, labouring Man, who went near it, was almoſt ſtruck down in an Inſtant with the Stench. *Boerhaave* obſerves in this Experiment, the dire Effects of this Degree of Heat; how ſoon it brought a moſt acute Diſeaſe, with very violent and mortal Symptoms; how ſuddenly the Humours were changed, the Oils, Salts, and Spirits in the Dog, being thoroughly putrefy'd in twenty-eight Minutes; and his Saliva ſo putrid, as to ſtink worſe than the rotteneſt Carcaſe: He alſo juſtly obſerves, that theſe were not the mere Effects of the Heat of the Stove; for if the Fleſh of a dead Animal had been hung up there, it

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(*o*) Does not this ſhow to what a Degree the Humours are rarefied and the Veſſels relax'd, when the very Foam is red?

it wou'd have dried, and not turn'd into a peſtilential Corruption; which muſt therefore ariſe from the Friction caus'd from the Motion of the Blood in the Lungs, and being in this Caſe not at all refrigerated.

2dly. of cold Air.

§ 12. Cold Air, by contracting the Fibres, increaſes the Elaſticity of the Veſſels; hence their Actions upon the contain'd Fluids are increas'd, and that in Proportion, as thoſe Veſſels are more or leſs contiguous to the Air: The external Veſſels therefore, being more contracted by it than the internal, the Fluids muſt neceſſarily be forc'd in greateſt Quantity into thoſe internal Veſſels; the Secretions therefore, from the internal Veſſels, will be proportionably increas'd; a larger Quantity of Matter will be thrown upon all the Glands, which will cauſe Pains and Tumors, wherever there happens an Obſtruction, or Defect in the excretory Duct.

A Change to a cold Air likewiſe, by contracting the cutaneous Pores, diminiſhes Perſpiration; the more groſs Parts whereof, being too long detain'd near the Skin, cauſes cutaneous Eruptions; or elſe, being determin'd upon the Inteſtinal Glands, cauſes Cholics, Gripings, Diarrhæas, or the like; by contracting the excretory Ducts of the Glands in the Fances and Lungs, cauſes Hoarſneſs, tickling Coughs, Defluctions upon the Lungs, Ulcerations, and Pulmonic Conſumptions, Pleuriſies, Peripneumonies, and Rheumatic Pains. But in ſuch a Climate, whoſe Temperature of Air is cold and dry, the Inhabitants are ſtrong, ſanguine People, their Fibres, by their greater Elaſticity, promote a free Diſcharge of the inſenſible Perſpiration; and their Blood is more denſe, and of an inflammatory Diſpoſition; for that accurate Obſerver of Nature, *Leewenhoek*, has ſhewn us, that the largeſt red Globules of the Blood are made up of ſix ſmaller Spheres, cluſter'd together in a very regular manner; and that ſo nicely, that in a perfect Globule the Compoſition comes to be imperceptible. He aſſures us alſo, that he ſaw Globules in the Blood much leſs than thoſe which compos'd the red Globules; ſo that the ſtronger and more elaſtic the Veſſels are, the denſer and more inflammable the Blood is; and this is what we call an inflammatory Viſcidity, or a pleuritic State of the Blood. On the other Hand, if the Veſſels be weak and lax, and the Circulation ſlow and languid, then the Blood, being an elaſtic Fluid, will expand it ſelf, and be leſs compact, more rare, and abound more with Serum, will be viſcid and indigeſted: In the firſt State, People are ſubject to all Kinds of Febrile Diſorders; in the laſt, to all Kinds of chronic Diſeaſes, as Lencophlegmatias, Anaſarcas, Conſumptions, or the like. Hence we ſee that the Inhabitants of ſuch a cold Climate, whoſe State of Air is ſuch as now deſcrib'd, ought to uſe ſuch Food as will attenuate; they ſhould alſo uſe warm Baths, warm Frictions, and moderate Exerciſe.

The Effects of moiſt Air; and of dry Air.

§ 13. Moiſture weakens the Elaſticity of the Air, as has been mention'd before; moiſt, foggy Air, by hanging too much upon the Skin and Veſſels, will weaken their Tone, and will hinder a proper Diſcharge of the perſpirable Matter, as *Sanctorius* ſhows (*p*); and more particularly weakens thoſe of the Lungs; hence the Viſcidity of the Blood will not be ſufficiently broken; whence Coughs, Catarrhs, Pulmonic Conſumptions, Aſthmas, Peripneumonies, Pleuriſies, Headaches, Dulneſs and Stupidity, Epilepſies, Apoplexies (*q*), Hoarſeneſs, cutaneous Eruptions, pale and languid Complections (of ſuch are the *Phaſians* mention'd by *Hippocrates* (*r*), for their Country is low and marſhy, the Air thick and moiſt) they have weak Appetites, are ſubject to ſcorbutic Habits, Fevers of diverſe Kinds, eſpecially Quartans and eruptive Fevers, Dropſies, Diarrhæas, Dyſenteries, *&c.* (*s*) and

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(*p*) Med. Stat. Sect. 2. Aph. 8. pag. 136.

(*q*) Hippoc. Aph. 16. Lib. 3. pag. 1247. Lib. de aere, aqua & locis. *Phaſis* was in the ancient Kingdom of *Cholcis*, upon the Eaſtermoſt Side of the Black Sea, between *Georgia* and *Circaſſia*, not far from the *Sauromatæ*.

(*r*) *Sydenham*. de Febrib. Intermitt. *Wainwright*'s Non-natural. pag. 69. *Floyer* on Cold Baths, pag. 108. Hippoc. Epidem. 1. pag. 2. & Lib. de aer, aq. & loc. pag. 281. lin. 36. *&c.* Galen. Comment. in hunc locum. *Wintringham*. Com. Noſolog. pag. 60.

(*s*) Hippoc. Lib. de aer, loc. & aq.

and are ſubject to ædematous Swellings: The Children are ricketty, and ſubject to Ruptures of the Veins, call'd Varices, and Ulcers on their Shins: The Women do not cleanſe well in their Lyings-in (*t*). Hence we ſee that to prevent theſe bad Effects above-mention'd, they ſhou'd uſe attenuating Foods, and alſo ſuch as will contract the Veſſels at the ſame Time; moderate Exerciſe, Friction, and ſuch like means, to promote Perſpiration. If the Air be cold withal, it ſubducts ſo much of its relaxing Quality.

Thick, foggy Weather, in ſome Countries may be prevented by proper Care; for we find that in ſome Places in *America* it was thick, foggy and rainy Weather, and alſo very ſickly, 'till the Woods were cut down, and then it became ſerene, clear and healthy.

I believe none will wonder at ſuch an Alteration in the Air, when they conſider

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(*t*) Philoſ. Tranſ. Abridg. Vol. 2. pag. 42. and pag. 719. Boerhaav. Chem. Vol. 1. pag. 621. Ludoric Teſti, de ſalubrit. aeris Venet. Act. Lipſ. Suppl. 111. pag. 167.

ſider what a great Quantity of Vapours perſpire from Vegetables. A Vine (*w*), ſays Mr. *Hales*, perſpires $\frac{1}{191}$ Part of an Inch in twelve Hours Day. A Sun-Flower, in a Day and Night, perſpires $\frac{1}{165}$ Part of an Inch. A Cabbage, in twelve Hours Day, perſpires $\frac{1}{80}$ Part of an Inch. An Apple-Tree, in twelve Hours Day, perſpires $\frac{1}{104}$ Part of an Inch. A Lemon Tree, in twelve Hours Day, perſpires $\frac{1}{243}$ Part of an Inch: And a Hop-Yard (*x*) perſpir'd as much in twelve Hours Day, from off the Hops (beſides what exhal'd from the Surface of the Ground) as would cover the Ground $\frac{1}{101}$ Part of an Inch deep, *i. e.* 220 Gallons an Acre: Now all this Moiſture, added to what daily exhales from the Surface of Water, which, as *Nic. Cruquius* obſerves (*y*) at a mean Rate the Year through, is $\frac{1}{13}$ Part of an Inch; and the Quantity of Vapours exhal'd from the Surface of the Earth is $\frac{1}{40}$ Part of an Inch in a Summer's Day;

(*w*) Stat. Eſſays, Vol. 1. Exper. 3. pag. 21. Exper. 5.

(*x*) *Ibid.* pag. 32. Exper. 9.

(*y*) Philoſ. Tranſ. Numb. 381.

Day; now, I ſay, all this Moiſture in the Air muſt needs render it unwholſome on that Account, as well as on Account of the Virtues of the vegetable Perſpiration.

Hippocrates (z) ſays, Women in this ſort of Weather, are ſubject to miſcarry; and that Men are ſubject to Diarrhæas and Hæmorrhoids; and likewiſe to the Puſtulæ Nocturnæ, Epinictides dictæ, but by *Pliny* call'd, *Puſtulæ liventes, & noctibus inquietantes*; they are alſo ſubject to ſore Eyes. In another Place he ſays (*a*), they are ſubject to long Fevers, Diarrhæas, Epilepſies, Apoplexies and Quinſies. Hence we ſee the Inhabitants of ſuch Places ought to uſe a warm, ſtimulant, aromatic Diet; and alſo warm Frictions, and brisk Exerciſe.

Dry Air.

Too dry Air has much the ſame Effect as too hot: *Hippocrates* ſays (*b*), *Per magnas ſiccitates morbi tabifici, ophthalmiæ, articu-*

(z) Lib. de aer. loc. & aq. pag. 281. lin. 44, 45.

(*a*) Aph. 16. Sect. 3. pag. 1247. & lib. de aer. aq. & loc. pag. 281. lin. 47.

(*b*) Loc. Citat.

articulorum dolores, ſtillicidia urinæ, dyſenteriæ. And again he ſays (*c*), *Per ſqualores febres acutæ fiunt, & ſi quidem annus magna ex parte talis extiterit qualem temporis conditionem effecerit, tales fere quoque morbos expectare oportet.*

§ 14. As the Air is a Fluid, it preſſes equally upon the Surface of a human Body, with a Weight equal to a Column of Mercury, whoſe Baſis is equal to the Surface of a human Body, and Altitude, that of the Barometer; perhaps in a middle ſiz'd Man, with a Weight of 32000 Pounds; and as it is poſſible for the Air to vary $\frac{1}{10}$ in its Weight, ſuch an human Body muſt be preſs'd with 3200 Pounds Weight more at one Time, than at another; and if the Height of the Mercury only varies one Inch, there will be the Difference of about 1000 Pounds Weight; ſuch Alterations muſt therefore very much affect both Solids and Fluids: For the Fall of Mercury in the Barometer, is the ſame with the Exſuction of ſo much

Heavy and denſe Air.

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(*c*) *Ibid.* Aph. 7.

much Air out of the Air-Pump; and the Riſe of the Mercury, the contrary: Hence, one would think, that when ſo many of the Veſſels of our Bodies are ſtraiten'd from the increaſed Preſſure of the Atmoſphere, that the Blood would ſtagnate up to the very Heart; but ſuch is the Contrivance of Wiſdom, that when the Reſiſtance to the circulating Fluid is increas'd (if not too much) ſo ſhould the Impetus of the Heart and Arteries be increas'd alſo; for the Weight of the Air being a little increas'd, the Lungs will be more forcibly expanded (*d*), and thereby the Viſcidity of the Blood more broken and attenuated; ſo that it is more fit for the Secretion of Animal Spirits, by which the Heart will be more ſtrongly contracted. Whatever be the Force of Air upon the Lungs, it varies with its Gravity and Elaſticity; conſequently, the Variation of thoſe, muſt have proportional Effects upon the Motion of the Blood through the whole Body, as well as through the Lungs: The Expanſion

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(*d*) *Hale*'s Stat. Eſſays, Vol. 1. pag. 238. Exper. 108. pag. 248. Exper. 111. pag. 255. Exper. 114.

ſion of the Lungs by Reſpiration, being neceſſary for the Circulation through the Lungs, the Circulation is therefore more eaſy in Proportion to ſuch Expanſion; on the contrary, whatever ſtops the Circulation through the Lungs, muſt hinder their Dilatation; whence it is very plain, Reſpiration muſt have an Influence upon the Pulſe, as to Frequency, Strength, Hardneſs, and Softneſs.

Heavy or denſe Air, compreſſes all the outward ſmall Veſſels, and alſo thoſe of the Lungs; whence the Blood will be more denſe and compact; the Veſſels of the other Viſcera and inward Parts remaining the ſame; which, if weak and relax'd, muſt often, either burſt, whence Hæmorrhages, or be obſtructed, whence Jaundices, hypochondriac, and hyſteric Diſorders, Apoplexies, Coughs, Aſthma's, or the like.

Light or rare Air.

§ 15. Light, or rare Air, relaxes our Fibres, the Preſſure being diminiſhed; for ſuppoſing the Quantity of the Fluids the ſame, and their Impetus againſt the

Sides of the Veſſels to remain with equal Strength; whenever the Preſſure of the Atmoſphere decreaſes, the Veſſels will be more ſtretched, by the Spring of the included Air, to bring the inward and outward Air to an Æquilibrium; and this is one Reaſon of that uneaſy Senſation, which many perceive upon a Change in the State of the Air; whence the Reſtitutions and Contractions of the Veſſels will be weaken'd; then thoſe Misfortunes will ſoon follow, which are mention'd under the weak and lax Fibres and Veſſels, Page 17. § 13. of the Introduction: The Fall of the Mercury in the Barometer being the ſame as the Exſuction of ſo much Air out of the Air-Pump; in which Caſe, the Fluids and Solids are expanded, for want of a ſufficient Weight or Force to compreſs the Veſſels; hence Hæmorrhages and Spitting of Blood, as well from Veſſels burſt, as from the Pores or Paſſages through which the Serum paſſes out of the Arteries into the Bronchiæ (*e*): It is the ſame with thoſe, who go to the Tops

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(*e*) *Hale*'s Hæmaſt. pag. 76. Exper. 11. Sect. 6, 7. and Exper. 12. pag. 88. Sect. 16.

Tops of the higheſt Hills and Mountains; for the higher they go, and the thinner and lighter the Air is, the ſhorter and quicker is their Reſpiration; becauſe, as we obſerv'd in the laſt mention'd Section, that the Expanſion of the Lungs is neceſſary for the free Circulation of the Blood through 'em: So that, the thinner and lighter the Air is, the leſs will the Lungs be expanded; whence the Blood will be leſs broken and divided, and will be diſpos'd to all thoſe Diſtempers, which proceed from too great Viſcidity therein, as mention'd in § 15. Page 22. in the Introduction; and they often ſpit Blood. Lord *Verulam* ſays (*f*), when they mounted to the Top of *Olympus*, the Air was ſo thin, that they were obliged to hold Sponges dip'd in Vinegar and Water to their Noſes and Mouths; and alſo, that the Air on the Top of *Teneriff* is ſo ſharp, as to cauſe violent Pains in the Eyes, and ſo thin and light, that it cauſes many to vomit. Animals gradually changing the Denſity or Rarety of the Air, can

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(*f*) Nov. Organ. Scient. Lib. 2. Aph. 12. pag. 163.

live in Air, differing one half in Denſity; but in a Receiver, ſinking the mercurial Gage 16 Inches, would throw a Man into Convulſions by the ſudden Change: A Mouſe uſed to an exhauſted Receiver, can indure it longer than a freſh one, as appears by Experience (*g*). We have alſo frequent Inſtances of the ſenſible Effects of the ſudden Fall of Mercury in the Barometer, in tender People, and in others who have Pains in Parts that have been diſlocated, cicatriz'd, and in Corns; for in ſuch a Change of Air, all the Veſſels that are in a natural State yield to the Expanſion of the inward Air, and relax, ſo as to permit the Blood and Humours to paſs eaſily through them; but in a Cicatrix, or Corn, the Veſſels being more rigid, are over-ſtretch'd and diſtracted, whence that violent Pain: Moreover, too light Air can't carry off the groſſer Parts of the Excretions in the Lungs (*h*), for the Pores and Excretory Ducts therein being relaxed, excrete a more groſs Humour than

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(*g*) Philoſ. Tranſ. Abridg. by *Lowth.* pag. 229, 230.
(*h*) *Ibid.* Vol. 2. pag. 231.

than naturally, which being ſpecifically heavier than Air, lodges there, cauſing Coughs, *&c.*

§ 16. The State or Temperament of Air in our Climate is moſtly compounded, *ex. gr.* warm and moiſt, or cold and dry; they who live in a warm moiſt Air, are generally of a lax Habit, corpulent, inactive, have pale and languid Complexions, weak Appetites, and the like; and are ſubject to Rickets, Ruptures, Epilepſies, Convulſions, Aſthma's, white Swellings, Worms, Green-ſickneſs, Obſtructions, Conſumptions, frequent Abortions, Barrenneſs, Fluor Albus, Diarrhæas, long Fevers, Piles; and to elderly People, Defluxions from the Head, Palſies, and many Diſeaſes, which, though common to all Situations, are yet moſt frequent in theſe, as many of the Authors already mention'd obſerv'd, eſpecially *Hippocrates* (*i*).

Warm and moiſt, and hot and moiſt.

The moſt likely Method to prevent theſe Inconveniences, are Foods, which will

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(*i*) Lib. de aere, aqua & locis.

will moderately attenuate, and diſſolve the viſcid Humours, and contract, and ſtrengthen the Solids; moderate Exerciſe, Frictions, cold Bathing, a cool and dry Air.

Hot and moiſt. If the Air be hot and moiſt, then the Inhabitants are ſubject to the Plague and peſtilential Diſeaſes, as *Sydenham* (*k*), Lord *Bacon* (*l*), and many others obſerv'd; the Plague call'd *Sudor Anglicanus* begun
* 1529. * after as moiſt a State of Air, as was ever known in the Memory of Man (*m*); and the *Morbus Ungaricus*, which alſo was ſo very riſe among the *Germans*,
† 1525 1566. *Dutch*, and *French* †, begun after a very wet Spring, inſomuch that the *Danube*, and other Rivers over-flow'd the whole Country (*n*): It is yet more unwholſome, when

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(*k*) In ſeveral Places.

(*l*) Sylv. Sylvarum, Cent. 4. Numb. 383. pag. 213. Chem. Boerhaav. Vol. 1. pag. 620, 621.

(*m*) Sckenkii Obſerv. pag. 765. *Verulam.* Hiſt. *Henric.* 7. pag. 18. *Rapin.* Hiſt. of *Engl.* pag. 756.

(*n*) Sckenkii Obſerv. pag. 766. Sennert. de Febrib. Lib. 4. Cap. 14. pag. 543. ſays, The State of Air in *Hungary* is always in Extremes, either very thick, cloudy, and foggy at Nights; or elſe very thin, and in Summer exceſſive hot. To this may be added, the ſtinking, ſtagnant when the Vapours ariſe from ſtinking Fens, Marſhes, or ſtagnating Pools, *&c.* This is yet more confirm'd by theſe two Examples, *viz.* at *Grand-Cairo*, the Vapours ariſing from a ſtagnating Pool bring the Plague, 'till, upon the over-flowing of the River, by which the Sluices are cleans'd and ſcour'd, and then the Plague ceaſes (*o*). And *Diogenes Laertius* (*p*) tells us, that *Empedocles* perceiving the Plague at *Selinis* to be caus'd by Exhalations from filthy, ſtinking Water in their Ditches, which he cleans'd by digging two Canals, to let in freſh Water from two Rivers in the neighbouring Country, and thereby freed them from the Plague.

Cold and moiſt.

Wintringham (*q*) obſerv'd, that in a wet, cold Seaſon, People had their Healths

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ſtagnant Fens, which, by the violent Showers from the Mountains, over-flow, and leave a ſtinking Mud on the Surface of the Ground. If you wet a Cloth in theſe ſtagnant Waters, and hang it in the Sun to dry, it will become louſy. The Inhabitants are often forc'd to drink theſe Waters.

(*o*) *Sandy*'s Travels, Book 2. pag. 97.

(*p*) Vit. Empedoc. Lib. 8. Segm. 70.

(*q*) Noſolog. Comment. pag. 80.

Healths better in general, than in other Seaſons, except a little at firſt.

Cold and dry.

§ 17. Cold, dry Air, is generally eſteem'd wholſome; the Inhabitants of ſuch Places are for the moſt Part healthy, of a florid Complection, but are ſubject to inflammatory and acute Diſeaſes, eſpecially to Pleuriſies, and are moſtly of a rough, choleric Temper, ſtrong and active, and have a voracious Appetite; are ſubject to internal Hæmorrhages, Bleedings at the Noſe in People about thirty Years of Age, and to Epilepſies; the Women are ſubject to difficult Births, but rarely miſcarry; they give but little Suck, and have but little of the Menſes; and the young Boys are ſubject to Tumors of the Teſtes (*r*) and Ophthalmies; But if theſe People eſcape acute Diſtempers, they are very often long-liv'd, as Lord *Bacon* (*s*) obſerv'd. Hence we ſee the Food of theſe

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(*r*) Hip. de aere aq. & loc. pag. 282.

(*s*) Hiſtor. vit. & mort. pag. 163, 164. Regionibus frigidioribus & hyperboreis diutius homines vivunt plerumque quam Calidioribus. *Plot*'s Hiſt. of *Oxfordſhire*, Cap. 2. pag. 1, 2. 3. of *Staffordſhire*, Cap. 8. from Sect. 91. to 107. Hip. loc. citat.

theſe People ought to be relaxant, attenuating, and cooling; they ſhould uſe warm Bathings, *&c.*

The Advantage of adapting the Air to the Exigences of the Caſe.

§ 18. There are few, I believe, who are not fully perſwaded, that the Air contributes to cure, as well as to cauſe Diſtempers; for the Lungs being the chief Organ of Sanguification, good Air muſt needs help the third Digeſtion; and moſt People find the Effect of good Air in ſtomachic, as well as pectoral Caſes; and it is Matter of Experience, that ſome People find themſelves much diſorder'd in one ſort of Air and Weather, and perfectly well in another: The Cauſe therefore of ſuch Diſorder is eaſily diſcover'd by any, who well underſtands the Phyſiology of Air, and the Conſtitution of the Patient. For this very Reaſon, the Nature and Effects of Air are a very proper Subject of Study, becauſe the Choice of it is very often a neceſſary Part of Advice.

The Methodiſts, a Sect of Phyſicians in the Time of the *Romans*, thought the

Air that we breath in continually, of more, or at leaſt, of as much Importance as our Food; and for this Reaſon they were always careful to accommodate the Air, to the Circumſtances of their Patients; for they not only made uſe of large or ſmall Apartments (as Occaſion requir'd) turn'd to the North, or where the Sun came but ſeldom, but even Grotto's and Places under Ground, not omitting the Leaves of Flowers and Branches of Trees, or ſprinkling cold Water upon the Floor, or the like, whenever they wanted to cool the Air, as in Fevers, Peripneumonies, &c. and Fires, Steams of Aromatics, a South Sun, and the like, whenever they wanted to warm the Air, as in Catarrhs, Dropſies, &c. nor is this Practice of theirs (uncommon or improper as it may ſeem) at all to be deſpis'd, ſince the Reaſonableneſs of it is very obvious, and a very great Phyſician among the Moderns (a Man of unqueſtionable Underſtanding) has approv'd of it himſelf (t) in ſome of the like Caſes. We read that *Empedocles* (*u*) of *Agrigentum* (a Town in *Sicily*) who flouriſh'd about the 84th Olympiad, perceiving the Plague often attended a South Wind, which was infected by pernicious Fumes iſſuing out of the Mouths or Caverns of ſome of the neighbouring Mountains, which he order'd to be ſtopp'd, and then the Plague ceas'd. We read alſo that *Hippocrates* (*w*) cur'd the Plague at *Athens*, by large Fires in the open Air; and in the Years 426 and 431 before Chriſt, when the Plague rag'd through *Ethiopia* to *Greece*, he, to prevent *Athens* from being infected, bid the Inhabitants burn a Wood near there (*x*); and alſo that *Varro* (*y*), in a peſtilential Seaſon near *Corcyra*, ſav'd many by changing the Windows and Doors from a South, to a Northern Poſition; ſo eaſy it is to remedy

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(t) Boerhaav. Aph. de Morb. inter. variis locis.

(*u*) Diog. Laertius de vit. Emped. Lib. 8. Segm. 70. Bonet. Theſaur. Vol. 1. pag. 443. Plutarc. in Lib. περὶ πολυπραγμοσύνης, & in illo cont. Colot.

(*w*) Auct. Lib. de Theriac. ad Piſon. Cap. 16. Aetii Amadei Tetrab. 2. Serm. 1. Cap. 94.

(*x*) Bonet. Theſaur. Vol. 1. pag. 440. Jacob. Hollerius, Lib. de Peſte, pag. 578. Thucidyd. Lib. 2. Lib. 3. Diod. Sicul. Lib. 12. pag. 310.

(*y*) Lemn. de Nat. Mirac. Lib. 3. Cap. 3. Diemerbroeck, Lib. 2. Cap. 5. Varro de re ruſ. 4.

medy many ſuch Things, when their Cauſes are known, as the learned *Celſus* ſays (z)——*Inveniuntur in quibus aliter atque in cæteris idem eveniat, cauſæ quoque eſtimatio ſæpe morbum ſolvit.*

(z) In Præfat. pag. 18. lin. 17. and 20.

CAP. II.

On EPIDEMICS.

§ 1. AS I have now given a true Phyſiology of Air, and alſo ſhown how human Bodies are affected by the various Changes of its Temperature and its Qualities, it may not be an improper Enquiry now to examine how far what I have ſaid thereupon, has been confirm'd by Obſervations made in our own Iſland by thoſe two learn'd Phyſicians, Dr. *Sydenham* and Dr. *Wintringham*; wherein they have not only given us an Account of the State or Temperature of the Air, but alſo the Epidemics, and the Symptoms that accompanied each State. This will give us a better Inſight into the Nature of Epidemics, which belong to each Temperature of Air; for we ſhall hereby by find, that we need not always call in the occult Qualities of the Air to our Aſſiſtance in accounting for the Changes made in an human Body, becauſe, as far as hath hitherto been obſerv'd, when any one preceeding and concomitant State of Air, in one particular Seaſon of the Year, happens to be the ſame as in another, that then the Epidemics have been pretty much alike; the ſame was obſerv'd by *Hippocrates* in his excellent Books of Epidemics, and in other Parts of his Works, which, if compar'd with thoſe made in our Climate in the ſame State of Air, we ſhall find very much alike, both as to the Diſtempers, and, in general, the Symptoms alſo; ſome of theſe Obſervations I ſhall add in the Notes. This will give us an Inſight into the Advantage of ſtudying that learn'd Man's Works, which have of late been almoſt laid aſide, out of a miſtaken Notion, that becauſe they were made in another Climate, they would be of no manner of Advantage to us in this; but I believe by what follows, the Reader will be convinc'd to the contrary, not only with Reſpect to *Hippocrates*'s Works, but alſo all ſuch as have wrote in that exact Method. It is not enough to read ſuch Hiſtories, though ever ſo true and critical, ſince the Memory is not able to retain a tenth Part of 'em, even though they were contracted; but we muſt carefully conſider each Part ſeparately, and ſo compare one Part of the Hiſtory with another, as to be able to draw general and juſt Concluſions from them; which being but few in Number, are eaſily remember'd, and ſo will become uſeful in Practice. And if every one that is capable would contribute his Share to ſo beneficial an Undertaking, we might, in a little Time, be furniſh'd with Maxims to direct us in a more ſucceſsful Practice, than what is known at preſent.

In 1675 a cold and moiſt Seaſon, after a warm and pleaſant one in October.

§ 2. *Sydenham* ſays (*a*), in the Year 1675, a warm and pleaſant Seaſon like Summer held to the End of *October*, contrary to Cuſtom; a cold and moiſt Seaſon came preſently after it, and there were

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(*a*) Cap. 5. Sect. 5. de Morb. Acut.

Coughs more than ever he knew at any other Time, ſparing ſcarce any Body, of whatever Age or Temperament, ſeizing whole Families together, and were very dangerous; for they fell upon the Pleura and Lungs with a Fever; the Epidemic Fever, which a Week before the Coming of the Coughs ſeiz'd the Head, now fell upon the Pleura and Lungs.

In October 1679 *cold and moiſt.*

He alſo ſays (*b*), that in 1679, *October* was almoſt continually rainy; in the Beginning of *November* Coughs were very epidemical, and more ſo than in other Years, for they almoſt ſeiz'd all in every Family. On the firſt Days moſt commonly the Cough was dry, and brought up nothing; but when it continued a while, a little Matter was expectorated: In a Word, upon Account of the little Matter that was expectorated, and the Violence of the Cough, and the Duration of the Fit, it ſeem'd like the convulſive Coughs of Children, only it did not rage ſo violently; but in this it exceeded the

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(*b*) Epiſt. ad Doct. *Brady*, pag. 234.

the Chin-cough, *viz.* it invaded the Sick with a Fever, accompany'd with the uſual Symptoms of it, which he never yet obſerv'd in Childrens Coughs. He ſays (*c*) alſo, that if the Coughs were ill manag'd, they occaſion'd a Fever like that which rag'd ſo epidemically in the Winter 1675; and this Fever was cur'd the ſame Way as the Coughs above deſcrib'd (*d*).

A very ſevere Froſt in Winter, 1683.

He ſays alſo (*e*), that the Winter 1683 was ſo vehemently cold, that no Man living ever ſaw the like, as to the intenſe Degree of the Cold, and the long Time it held; the River *Thames* was froze over that it ſuſtain'd Coaches, *&c.* and though the Winter in 1684 did not equal the preceeding, either as to Extremity of Cold, or the obſtinate Duration of it, yet it did not come much behind it as to either

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(*c*) Pag. 238.

(*d*) We muſt obſerve, that here were two cold, moiſt Seaſons, which had the ſame violent Coughs very epidemical: Are not theſe Coughs produc'd by the viſible Qualities of the Air? And do they not confirm what I ſaid in § 13. in the Chap. of Air.

(*e*) Monitor. Schedule, pag. 409.

either (*f*); but as ſoon as it thaw'd in *February* 1685, a new ſort of Fever began, which was wholly different from that which prevail'd for theſe eight Years paſt, and laſted all Summer.

The Sick was cold and hot by Turns; complain'd of Pains in the Head and Limbs; the Pulſe like the Pulſe of thoſe that are well (*g*); the Blood like the Blood of Pleuritics; the Patient for the moſt part is troubled with a Cough; a Pain ſeizes the Neck and Jaws, ſometimes at the Beginning of the Diſeaſe, but it is leſs than in a Quincy; though the Fever be continual, yet it has violent Exacerbations, often towards Night, as if it were a double Tertian or Quotidian. The Sick was indanger'd by keeping his Bed conſtantly, though he had but very little Clothes on, for he ſoon fell into a Coma or

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(*f*) This ſevere and obſtinate Cold, by § 12. of Air, will render the Blood very denſe, as we find by Experience, of which we ſhall ſee more as we proceed.

(*g*) May not this be owing to the great Relaxation of the Fibres, after they had been ſo long and ſo intenſely brac'd up? For we know that the Strength and Hardneſs of the Pulſe is as the Elaſticity of the Veſſels, and the State of the Humours, or Phrenſy (*h*), which alſo often comes of it ſelf on a ſudden, but not to a great Degree; the Sick only doats, muttering now and then ſome odd Words: Petechiæ very often broke out, by Reaſon of the unſeaſonable Uſe of Cordials, and too hot a Regimen; and in young People of a hot Conſtitution, purple Spots, and ſometimes Eruptions, which they call Miliares, ſprinkle themſelves all over the Body. The Patient's Tongue is either moiſt or dry, according to the Method made uſe of; when it was dry, it was of a duskiſh Colour in the Middle, which was hemm'd round with a whitiſh Fringe; but when it was moiſt, it was all white, cover'd alſo with a white and filthy Skin: If the Perſon was too much heated, the Sweat was in a manner viſcous (*i*), eſpeci-

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(*h*) May not this be owing to the denſe State of the Blood, which circulates but ſlowly in the Brain? And may not the Laxity of the Veſſels be the Reaſon, why the Phrenitic were not outrageous, but rather comatoſe?

(*i*) Does not this prove a great Relaxation of the Veſſels? And does not the Clammineſs demonſtrate it to be owing to that? For Perſpiration is ſecreted by the cutaneous Arteries, and the ſtronger and more elaſtic they are, the finer the perſpirable Matter is; But if theſe Arteries ally about the Head; and though it flow freely, and from all Parts, yet the Sick has little Eaſe by it; ſo that it was only ſymptomatical, not critical.

1715, *cold, froſty Weather for ſix Weeks, with South Winds.*

Wintringham ſays (*k*), that Mid-winter, in 1715, was cold, froſty and ſnowy Weather for ſix Weeks, with a Southerly Wind for the moſt part. The Spirit in the Thermometer was the loweſt, and the Mercury in the Barometer the higheſt he ever ſaw (*l*).

The Diſtempers are inflammatory, eſpecially Pleuriſies, Quincies, Rheumatiſms, with acute Pain and hard Pulſe: The Blood was inflam'd, and had a thick Film. Phthiſical and conſumptive People were much worſe; their Breathing was more

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are either too much relax'd, or if the Blood circulate too freely and quick, then there is a greater Quantity evacuated, of a thicker Conſiſtence, and ſupplied more immediately from the Blood, being ſome of its nutritious Parts, and being ſenſible, is call'd Sweat.

(*k*) Comment. Noſologic. pag. 29.

(*l*) Does not theſe ſhow to what a Degree the Solids were brac'd up? And as the Strength of the Pulſe, as I obſerv'd before, depends upon the Elaſticity of the Fibres, the ſtronger they are, the harder is the Pulſe, and the Blood is more condens'd, as is confirm'd by the thick Film.

more difficult, and with pleuritic Pains (*m*) and incurable Looſeneſſes (*n*). In *February*, at the Thaw, the Symptoms were worſe, and more were ſick of inflammatory Diſeaſes. Conſumptive People died faſt, for their Diarrhæas increas'd in many (*o*).

Other weakly People were afflicted with Gripings, Diarrhæas, Stranguries, with aſthmatic, hyſteric and hypochondriac Symptoms above others. They who had Strength enough, were well in

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(*m*) Now let us ſee how far *Hippocrates*'s Obſervations agrees with ours: He ſays, Lib. 3. Aph. 17. pag. 1247. "Northerly Winds increaſe the Pains in the Breaſt, if "there were any before." And in Lib. de Humorib. pag. 50. that "The Northerly Winds bring Pains in the "Sides and Breaſts." *N. B.* He by Northerly or Southerly, means cold or warm, as is evident from ſeveral Parts of his Works.

(*n*) Does not this confirm part of § 12. of Air?

(*o*) The Author obſerves, that the Mercury in the Barometer, about the Thaw, fell about two Inches; and the Spirits in the Thermometer roſe twenty Degrees; this remarkable Change in the State of the Air, he obſerv'd, made a great Diſturbance in the Humours; in ſome it brought on a Drowſineſs, Looſeneſs, arthritic and rheumatic Pains, as well wandering as fix'd; and in ſome, Palſies and Apoplexies, as well as the above-mention'd Diſeaſes. Who can doubt that theſe proceeded from the Rarefaction of the Humours, caus'd by the Weight of the Atmoſphere being leſſen'd, and the Warmth of the Air increas'd? Do not theſe confirm, what I ſaid in § 14 and 15. of Air?

a few Days; but others either died, or had very bad Symptoms. Small-Pox was very riſe, of the confluent and bad ſort, and were the worſt in the greateſt Cold.

Theſe inflammatory Diſtempers were fewer as the Summer approach'd. The Small-Pox continu'd, and were chiefly of the confluent ſort, but yet in a leſs Degree than in the Winter (*p*).

1716, *Summer hot, with Weſterly Winds.*

§ 4. Summer was hot (but not ſo hot as ſome of the following Summers) with weſterly Winds. Diſtempers in this Seaſon were ſome continual, remitting Fevers, call'd συνεχης; and ſome ſlow Fevers. The Skin in the former was drier and rougher, the Pulſe hard, the Blood pleuritic; they ſweat but little, and were oft delirious (*q*), eſpecially in the Paroxyſms of remitting Fevers.

Some

(*p*) May not this Difference proceed from the intenſe Cold in Winter; which, by bracing up the Solids, makes the Fever more violent, and the Blood more inflamable? And may it not, by contracting the Pores, hinder the free Exit of the morbid Matter? And is not this agreeable to what I ſaid in § 12. of Air?

(*q*) This ſeems to be a Symptom which almoſt conſtantly attends a hot and dry Seaſon; as a Drowſineſs and Weight of the Head, and Coma, do a wet and moiſt Seaſon; which ſeems to be owing to the Blood in the firſt State being thick and more inflamable.

Some in the Beginning were afflicted with Diarrhæas, Vomitings, and with pleuritic and rheumatic Pains. About the 14th Day they either went off by Sweat, or quite ceas'd, or chang'd into Tertians.

In the nervous Fevers they were longer ſick, the Pulſe quick and weak, the Skin dry and rough. The Small-Pox laſted all the Summer, and quite vaniſh'd in Winter, but were more mild. The other Fevers ſtill remain'd.

Cold and froſty Winter.

The Winter was cold and froſty in 1716, towards the End, but not ſo ſevere as the preceeding Winter, the ſame Diſtempers appear'd as in the laſt Winter, but were more mild, and fewer in Number (*r*).

1717, hot and dry Summer.

§ 5. The Summer in 1717 was hot and dry, about its Middle, with Southerly and Weſterly Winds. The Diſtempers were

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(*r*) Is not this owing to a leſs Degree of Cold? And does not this ſtill confirm § 12. of Air?

were Remittents and Intermittents, eſpecially the former, and in greater Number than in the laſt Year.

In the Beginning, the Diſeaſes ſcarce ever remitted; for they were moſtly σύνοχος; yet in a few Days an imperfect Criſis appear'd, ſometimes by the Anus, and ſometimes by the Pores, and ſhow'd they belong'd either to Intermittents, or Remittents.

The Urine before the Criſis was moſtly high colour'd, and without Sediment, ſometimes was turbid; but after the Criſis, the Sediment was like Brick-duſt, but ſomething more pale and yellow.

Autumn cold and moiſt.

The Autumn was cold and moiſt, frequently with Northerly Winds. The fore-mention'd Diſeaſes continu'd; then Diarrhæas and Dyſenteries appear'd, join'd with a ſlow Fever; which, if they happen'd to thoſe who were ill before, made 'em low-ſpirited, and prolong'd the Diſeaſe (*s*).

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(*s*) Do we not find theſe to be confirm'd by *Sydenham* in ſeveral Places? And do they not confirm Part of what I ſaid in § 13. of Air, and § 3. in the Chap. of Excreta and Retenta?

Winter cold, froſty and ſnowy.

The Winter, about the Middle, was very froſty and ſnowy, with North and Eaſterly Winds. During the Froſt, the ſame Diſtempers appear'd as in laſt Winter; and the Fever call'd συνεχεῖς remain'd, but not very frequent.

1718, *Summer and Autumn hot and dry.*

§ 6. The Summer was hot and dry, eſpecially *July* and *Auguſt*, which continu'd all Autumn, except a few neceſſary Variations of the Seaſon, with Southerly and Weſterly Winds.

In this Summer appear'd the Febris putrida, call'd σύνοχος, accompanied with bad Symptoms; but as it increas'd more the Year following, I will let the particular Deſcription of it alone 'till then.

Remitting Fevers ſtill continu'd; but with very uncertain Paroxyſms, and worſe Symptoms: Theſe laſted all Winter, and were more frequent than in the laſt Winter, though ſome were chang'd into Intermittents in the Cold of Winter. Tertians with regular Paroxyſms appear'd through the whole Year; but in the Beginning of the Spring, the Paroxyſms return'd in leſs certain Intervals; and towards Summer the Remittents increas'd in Number 'till the Heat of Summer.

1719, *Summer exceeding hot and dry, changed ſuddenly to cold for a Fortnight; and then the Heat return'd, and for the Seaſon was warmer 'till* Novem.

§ 7. This Summer was not only the hotteſt he ever ſaw, but the Change from one State to the other was the moſt ſudden (*t*). The Heat laſted from the Beginning of *May* to the Middle of *July*, and the Air was very dry; there was but little Wind, and that from the South; the Spirits in the Thermometer was then at 17 Degrees; about this Time the Wind chang'd to the North, and blew very hard, and ſome cold Rain fell: The Spirits in the Thermometer, in 48 Hours, fell from 17 to 45 Degrees (*u*), which was the greateſt Variation in ſo ſhort a Time he ever knew. This cold State laſted

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(*t*) Hippoc. Lib. de Humorib. pag. 50. the Changes of the Seaſons are moſt productive of Diſeaſes, the greateſt Changes eſpecially.

(*u*) We obſerv'd in § 4. of Air, that Animals are ſenſible of a Change of Air to a colder State, when the Spirits in the Thermometer do not vary in the leaſt; what an Alteration then muſt this ſudden and great Change make in our Conſtitutions? *Vid.* pag. 103. in the Notes, Let. (*o*).

laſted a Fortnight, and then the Heat return'd; which laſted to the Beginning of Autumn; and conſidering the Seaſon, the warm Weather laſted to the Beginning of *November*; and the Winter was drier and warmer than uſual.

Diſtempers during the hot Weather were putrid, continual, remitting and intermitting Fevers, large ſpontaneous Hæmorrhages, Spittings and Vomitings of Blood, and ſuch like (*w*); but upon the ſudden Change to Cold, immediately appear'd Diarrhæas, which ſoon vaniſh'd at the Return of the warm Weather. They who had the above-nam'd Fevers at this Time, were troubl'd with Gripings and Looſeneſſes; for the Humours which during the Heat went off by Sweat about the Criſis, now went off by Stool, very much weakening the Sick (*x*).

At

(*w*) Do not theſe proceed from the great Heat and Drought, weakening the Veſſels, relaxing the Pores, and expanding the Fluids? And do they not confirm part of § 11. of Air?

(*x*) Do not theſe, together with what happen'd in the cold State in 1715, 1716, 1717, prove, that the Perſpiration and Humours are turn'd inward, as I ſaid in § 12. of Air?

At the Return of the Heat, the putrid and continual, remitting Fevers were worſe. We muſt obſerve that the Sick about the Criſis were more ſubject to Diarrhæas ſince the Cold, than before, tho' the Diſeaſe ſeldom went off this Way. The putrid Fever this Year, firſt appear'd in *May*, and in *July* came *ad* ἀκμὴν, which laſted all *Auguſt*, and kill'd many. It begun with Shiverings, Nauſea's, and Vomittings of bilioſe Matter, and alternate Heats and Cold; to theſe were join'd a Wearineſs of the whole Body, and a Senſation as if a great Weight lay upon the Shoulders and Back; to theſe ſucceeded Heat and Thirſt; the Tongue was dry and brown, and ſometimes black. They ſlept little, did not ſweat, and almoſt always were delirious; toſs'd about the Bed with great Anxiety and Uneaſineſs. About the 12th Day, many were troubl'd with Diarrhæas, which weaken'd 'em, and ſeldom eas'd 'em; and that too, notwithſtanding they had taken a Vomit in the Beginning, as *Sydenham* adviſes; ſome were a little looſe all the

Sickneſs; for altho' the Fever did not go off this Way, yet the Heat, Uneaſineſs, and Delirium were not ſo violent *(y)*; neither did ſuch an Evacuation hinder a Criſis, but rather, by eaſing the Symptoms, brought it on, which for the moſt part happen'd the 16th Day from the Beginning of the Fever, by Sweat.

The Pulſe for the moſt part was frequent, ſeldom ſtrong; the Skin rough; Urine red, without Sediment: But after the Criſis by Sweat, the Sediment was brown. The Blood taken in the Beginning of the Diſeaſe was very florid and diſſolv'd (*z*), and the red and ſerous Part was ſo mix'd, that it look'd like arterious Blood. Some had a Ptyaliſm during the whole Diſeaſe, and they all recover'd; they alſo had the other Symptoms

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(*y*) Does not this ſhow us a Method of managing People in ſuch a State?

(*z*) Does not this Thinneſs of Blood proceed from the ſudden Weakneſs of the Veſſels occaſion'd by the Heat? For as the Blood is an elaſtic Fluid, a ſudden Laxation of the Veſſels muſt needs give it Room to expand and be diſſolv'd. And the Blood in hot Weather is more ſubject to putrefy than in cooler, as appears by § 11. and § 15. of Air. Boerhaav. Chem. Vol. 1. pag. 175.

toms more mild than other Sick had: This Fever chiefly ſeiz'd the Strong and Active; but they of a weak, lax, hyſteric and cachectic Habit were affected with Tremors, Spaſms, and Deliriums; whilſt others, through Want of Spirits and Weakneſs (*a*), lay ſtupified, letting their Urine and Fæces go from them involuntarily.

Beſides this Fever, there were continual, remitting Fevers, eſpecially about the Beginning of *Auguſt*; a little after which Time, either the σύνοχος vaniſh'd, or chang'd into Remittents, which laſt is likely; becauſe theſe Fevers begun with the ſame Symptoms, which by irregular Turns remitted. The Paroxyſms were attended with more violent Symptoms than Remittents commonly have, and often with a Delirium (*b*). The Rigor and Coldneſs ſeldom preceeded the Paroxyſms, even

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(*a*) May not this Weakneſs proceed from a too great Excretion of perſpirable Matter and Sweat, depriving the Blood of it's moſt nutritious Parts? And does not this confirm part of what I ſay in § 6. of Excret. & Retent. and alſo of § 11. of Air?

(*b*) Does not this confirm what I ſaid in the Notes to § 4. pag. 104. Let. (*q*)?

even in thoſe, whoſe Fits return'd regularly; but they who had ſome Coldneſs accompanying it, ſoon recover'd. About the Beginning of Winter, they chang'd into Intermittents, attended with a gentle Coldneſs; the Paroxyſms returning daily, as well in Winter, as in Summer.

This Year there were a greater Number of Maniacs than common (*c*): And this Year abounded with a greater Number of Sick, and with ſeverer Symptoms than any that I remember.

§ 8. This Year was attended with a greater Drought than is common to this Iſland, but nothing near ſo hot as the laſt.

1726, *the whole Year droughty; but not ſo hot as the former.*

Diſtempers were Remittents and Intermittents, pretty much of the ſame Kind as thoſe in the Decline of the laſt Year. They did not remit for ſome Days, and the Sick were delirious in the Paroxyſms; but

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(*c*) May not this hot Seaſon, by depriving the Blood of its thinner Parts, and by rendering the Remainder more acrimonious and viſcid, cauſe Obſtructions in the Head, *&c.*? And does not this confirm part of § 11. of Air?

but the Paroxyſms were more regular, and the Fevers were moſtly Tertians, or rather Hemitritæans; for the Paroxyſms were long, and ſoon return'd, and the Fever never quite ceas'd; during the Paroxyſm, they complain'd of Pain in the Stomach, Sickneſs and Nauſea, and ſometimes they vomited, eſpecially in the Beginning of the Paroxyſms; which Symptoms laſted 'till the Sweating came and put an End to the Paroxyſm; after which, for a few Hours, the Fever abated, and the Sick was eas'd; but yet they had not a perfect Apyrexy. The Heat and Thirſt were more mild than in the laſt Year (*d*); the Tongue was firſt whitiſh, and then became brown. The Paroxyſms ſometimes laſted 40 Hours.

The Urine was more turbid and more yellow in the Remittents, than in the laſt Year; and depos'd a whitiſh, yellowiſh Sediment in plenty: In the Intermittents, the Sediment was lateritious.

Beſides

(*d*) May not this be owing to this Seaſon being cooler than the laſt?

Beſides theſe, a few putrid Fevers, more mild (*e*) than thoſe of the laſt Year appear'd; but the weak and nervous Fevers, which were attended with a Vertigo, Stupor and Tremors of the Nerves ſeiz'd the weak, lax, and hyſteric People; in theſe the Pulſe was weak and quick; the Urine thin, pale and crude; and they had ſometimes a Diarrhæa with it.

The Tongue was whitiſh, rarely dry; neither were the Sick dry; were ſubject to partial Sweatings, eſpecially about the Head, Neck and Breaſt. In theſe, the Fever laſted to the 20th Day, ſometimes longer, and went off moſtly with a total Sweating; but in ſome they chang'd into Intermittents.

1721, *a moiſt, cold, rainy Summer to* September, *thence to* November, *warm and pleaſant; the Winter was mild.*

§ 9. This Year was moiſt, cold and rainy, eſpecially in the Summer, attended with Northerly Winds; which State laſt-

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(*e*) May not this be owing to the Dryneſs and Coolneſs of this Seaſon? For nothing will putrefy ſo ſoon in a dry, cool Seaſon, as in a hot, moiſt Air.

ed to the Beginning of *September*; from whence, to the Beginning of *November*, was warm and pleaſant; and the Winter was mild, with very little Froſt.

The Fevers, tho' of the intermittent Kind, yet differ'd from thoſe of the laſt Year; in that they were attended with greater and longer Cold, and with ſhorter and milder Heat; and they, in the Intervals, enjoy'd a perfect Apyrexy; were not delirious in the Paroxyſms, and were more ſubject to Looſeneſſes (*f*). The Urine was redder, and depos'd a Literitious Sediment.

Beſides theſe, there appear'd ſome ſlow, nervous Fevers (*g*), with a Weakneſs and Dejection of Spirits, with a Stupor and Deafneſs (*h*), not unlike them in the laſt Year;

(*f*) Does not this the more confirm § 12 and 13. of Air? And does not this greater Degree of Moiſture and Cold, in this, than in the laſt Year, make the Humours more viſcid, as mention'd in § 13. of Air, but leſs acrimonious; and thence theſe Changes in theſe Fevers?

(*g*) This agrees with what *Hippocrates* ſays in Lib. 3. Aph. 16. *viz.* "In wet Seaſons are long Fevers."

(*h*) Theſe are what ſeldom fail attending ſuch a Seaſon as this, as we obſerv'd before; *vid.* § 13. of Air.

Hippo-

Year; except in that they ſweat but little (*i*), and the Fevers ſeldom ended in a Criſis, but went off gradually; and few died. In *April* the Meaſles appear'd, and laſted all Summer: They were of a bad Sort, with a conſtant Cough, Difficulty of Breathing, and a Peripneumonia (*k*).

§ 10. The Spring, and half Summer, was more cold, wet, rainy and windy than uſual, eſpecially with North and Eaſt Winds. Diſeaſes were ſome Pleuriſies and Quinſies, but not very frequent; above all the reſt Tertians appear'd (*l*), with a few Quartans, eſpecially in thoſe Perſons who are ſubject to Tertians. Some had Diarrhæas, but they were eaſily cur'd.

1722, *Spring and half Summer cold, wet and rainy, with Northerly Winds.*

Hippocrates ſays, " The South Wind (which we obſerv'd before, in § 13. of Air, pag. 34. brought watery Vapours) " brings on Thickneſs of Hearing, Heavineſs of " the Head, and Dizzineſs, Lib. 3. Aph. 17. pag. 1247." And in Lib. de Humorib. pag. 50. he ſays, " It brings on " Thickneſs of Hearing, and Heavineſs of the Head: " when this State prevails, the Sick complains of theſe " Symptoms."

(*i*) May not this be owing to the cool Seaſon?

(*k*) People in almoſt any Diſtemper, are ſubject to theſe Symptoms in ſuch a Seaſon as this.

(*l*) We muſt obſerve, that Intermittents which accompany ſuch a State of Air as this, require ſome warm Aromatics to be join'd with the Bark.

cur'd. Many of theſe Tertians, about Autumn, chang'd into Quartans, which diſappear'd in the Spring.

The Winter was ſharp and dry, with North and Eaſt Winds, eſpecially about the End, which State laſted all Spring.

About this Time, many of the common People had Jaundices (*m*), Phthiſes and Dropſies, eſpecially that Sort call'd Aſcitis; of which Diſtempers (though they are not epidemic yet) more were ill, than in any of the former Temperaments of Air.

1723. *Summer dry, but not in Proportion; hot, with Northerly and Eaſterly Winds, to the Beginning of Winter.*

§ 11. This Summer was very dry, but not hot in Proportion; for it was cloudy with North and Eaſt Winds: This State laſted to the Beginning of Winter, conſidering

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(*m*) *Hippocrates* ſays "About, and after the Winter "Solſtice, the Wind was Northerly, with rough Winter "Weather; in a ſhort Time, Southerly for fourteen "Days, and then abundance of Snow fell for fourteen "Days more. About this Seaſon, deep colour'd Jaundices appear'd, that terminated not in a clear and evident manner, but return'd again. After the Snow "came Southerly Winds, and gentle Showers; Runnings "at the Noſe ſoon enſued, with and without a Fever. "Lib. 4. Epid. pag. 1121."

dering the Seaſon; ſo that all this Seaſon may juſtly be ſaid to be drier, but cooler than uſual.

In the Spring the Small-Pox appear'd, which laſted all Summer, moſtly of the confluent and bad Sort, ſometimes with purple Spots; they who had a moderate Looſeneſs during the whole Sickneſs, had milder Symptoms: Many of 'em, before the Eruption of the Puſtles, were afflicted with pleuritic and violent nephritic Pains (*n*); and the Blood from the Beginning was not a little inflam'd.

The other Diſtempers were Pleuriſies, Quinſies, Rheumatiſms, and other Diſtempers, with Inflammations of particular Parts. Many had Stranguries (*o*), others perpetual Coughs (*p*), from a thin and ſharp

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(*n*) Theſe Symptoms often attend upon a cold State of Air, more eſpecially when Pleuriſies, and ſuch like, are ſtirring. *Hippocrates* obſerv'd the ſame, Lib. 3. Aph. 17. pag. 1247. Lib. de Humorib. pag. 50.

(*o*) Do not theſe confirm part of what I ſaid in § 11 and 13. of Air, under too dry Air? *Hippocrates* obſerv'd the ſame, Lib. de Humorib. pag. 50.

(*p*) *Hippocrates* ſays, "The Ornithiæ (they are Spring "Winds of the Northerly Kind, that ſet in about the

Serum; phthiſical and aſthmatic Perſons were great Sufferers this Year, and many died; for their Cough was very much increas'd with an hectic Fever, and the Symptoms thence ariſing; the Cough tormented 'em much.

The Pulſe in the inflammatory Diſtempers was quick and hard, the Skin tenſe and rigid; and the Blood was more inflam'd than uſual in other Years: Nor did any labour under any Diſtemper, eſpecially where there was the leaſt Pain, but there was an inflammatory Cruſt upon the Blood (*q*). They were moſtly coſtive (*r*).

In

"Coming of the Swallow, as *Pliny* tells us, Lib. 2. Cap. 47.) blew much and cold: Snows fell ſometimes after clear Weather; and after the Æquinox came Southerly Winds, mix'd with Northerly, and frequent Showers. Many Coughs were epidemical, eſpecially among Children. Before this, Part of the Winter was rough and turbulent, Epid. Lib. 7. pag. 1236."

(*q*) Is not this owing to the cold State of Air which has contracted the Fibres and condens'd the Blood? *Vid.* § 12 and § 17. of Air.

(*r*) *Hippocrates* ſays, "This Sort of Air dries the Belly, Lib. 3. Aph. 17. pag. 1247." We muſt here take Notice, that when the Weather is cold and dry for a conſiderable Time, then it, by ſtrengthening the Fibres, promotes a free Perſpiration, and a ſtrong and thorough

In Autumn the Weather chang'd to be cold ſuddenly, but yet dry, and then the Number of the Sick increas'd; and Diarrhæas, Dyſenteries, and Inflammations of the Bowels were more frequent (*s*); this State laſted to the Middle of *November*, when much Rain fell; and the Quickſilver, which ſtood the higheſt during the Drought, now fell about two Inches (*t*); though this State did not laſt long, yet it greatly increas'd the Number of Sick of the above-nam'd Diſeaſes, but above all the reſt, Pleuriſies, Rheumatiſms, and arthritic Pains.

Sudden Cold in Autumn.

The Pulſe was quick and hard, and the Blood was ſo inflam'd, that the Film or Cruſt was almoſt half the Thickneſs of

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thorough Digeſtion; hence they become coſtive, as the Inhabitants of ſuch a Temperature of Air in general are; but upon a ſudden Change of the Air to a cold State, then a Looſeneſs, &c. as mention'd in § 12. of Air.

(*s*) Do not theſe ariſe from the Perſpiration being turn'd inward? And do they not confirm part of § 12. of Air?

(*t*) This ſudden and great Change could not fail of diſturbing the Humours, § 14 and 15. of Air.

of the Blood (*u*); inflammatory Diſtempers, of what Kind ſoever, were more frequent and more ſevere, than in the former Years.

In about three Weeks, the dry Weather return'd, and continu'd to the Vernal Æquinox, and the inflammatory Diſtempers ſtill remain'd, eſpecially Rheumatiſms, but yet fewer in Number.

About the Æquinox, the Air was inconſtant; there were ſome Quinſies and Pleuriſies appear'd, but much milder than thoſe of the laſt Year.

1724, *Summer cold and wet; Wind North to the Beginning of Winter; then a ſharp Froſt for a Week; then very wet and rainy, with North Winds.*

§ 12. Summer was cold and wet, with moſtly a North Wind; the Spirit in the Thermometer was lower than uſual, conſidering the Seaſon; for the Spirit ſtood about 45 Degrees, and ſeldom roſe above 40. About the Middle of Autumn it was

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(*u*) From § 12 and § 17. of Air we find, that the Veſſels are contracted and more elaſtic, and then the Velocity of the Blood is increas'd; the thinneſt Parts of the Blood are diſſipated; hence the inflammatory Viſcidity; whence the Small-Pox became ſo violent.

was pleaſant, ſerene Weather, with South and Weſterly Winds; which laſted to the Beginning of Winter, when a ſharp Froſt came and laſted a Week: To this ſucceeded a wet, rainy Seaſon, which laſted to the Beginning of *January*, with North Winds; and therefore this Year may be call'd a cold, wet one.

During the Spring and Summer the Seaſon was exceeding healthy (*w*), few Diſtempers appearing, and them of a good Sort; which healthy State laſted to the End of Autumn. About this Time many had Gripes and Looſeneſſes, and in many, great Hæmorrhages per Alvum. When the Froſt came, Rheumatiſms return'd and ſeiz'd many (*x*): The Blood of the Rheumatics was not ſo much inflam'd in this Year as in the former, neither was the Cruſt ſo thick (*y*). Other febrile Diſtempers,

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(*w*) *Hippocrates* ſays, " If Summer be like Spring, " Fevers will be of a good Sort, neither very acute, nor " attended with dry Tongues. Lib. de Humorib. pag. 50. " Lib. 3. Aph. 6.

(*x*) Is not this occaſion'd by immediately contracting the Fibres?

(*y*) Does not this prove the Fibres were more relax'd in this, than in the laſt Year?

Diſtempers, above what are already mention'd, were few, but moſtly accompany'd with Diarrhæas, and went off ſometimes that way (*z*). This Year the Small-Pox appear'd, but for the moſt part diſtinct, few, and of a good Sort (*a*).

From January *to the Middle of* April, *warm and pleaſant, with Southerly and Weſterly Winds.*

In *January* 1724, the State of Air was warm, pleaſant and ſerene (conſidering the Time of the Year) with Southerly and and Weſterly Winds, which continu'd to the Middle of *April*, except a few Days.

At this Time appear'd Pleuriſies, Rheumatiſms, and but few other inflammable Diſtempers. The Blood in all theſe was like that of Pleuritics.

About the Middle of *February* appear'd ſome remitting and intermitting Fevers, with a greater Degree of Inflammation in the Blood than common in thoſe Diſtempers; the Sick parted with a great Quantity

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(*z*) Is not this owing to the Perſpiration being turn'd inwards?

(*a*) Is not this owing to a leſs inflammable State of Blood, and a more relax'd State of Fibres?

tity of binoſe Matter, both by Stool and Vomiting, with great Sickneſs. Theſe at firſt ſeem'd like the σύνοχος in the Beginning, but in a few Days, eſpecially after Bleeding, ſoon turn'd into συνεχης, or into Intermittents. Although theſe Diſtempers deſervedly belong'd to the Intermittent Claſs, they were very liable to be turn'd into συνόχȣς, in that, every Paroxyſm, though in thoſe which intermitted, return'd ſooner, and with worſe Symptoms than the former.

Whilſt theſe Fevers were continual, the Urine was red, and without Sediment; but when they chang'd into Intermittents, depos'd a Sediment in plenty, and of a deeper Redneſs than common.

Snow in March.

In the Beginning of *March*, and about the End of it, a little Snow fell, and the Spirit in the Thermometer fell about 10 Degrees, the Wind being Northerly and Eaſterly. About this Time the Chin-Cough was very riſe (*b*), and laſted all Summer.

§ 13. About

(*b*) May not this be owing firſt to the Seaſon relaxing the Veſſels, and thickening the Humours for a conſiderable

1725, *from the Middle of* April *to* December, *cold and wet.*

§ 13. About the Middle of *April* 1725, the Weather was very cold and wet for the Seaſon, and laſted 'till the Middle of *December*, except a few Days; and in a greater Degree than in any of the foregoing Years.

This Summer was more wholeſome than the former; and, in general, I found the wet Seaſons more healthy than the dry and hot, except for a few Weeks at the Beginning of the Moiſture, which immediately follows the dry Seaſon.

In Autumn a little Fever appear'd, with Sickneſs, Nauſea and Vomiting; to which ſucceeded a troubleſome Itching, and cutaneous Eruptions (*c*); yet they went

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derable Time; and ſecondly to the changing to a cold State, contracting the Veſſels, Glands, &c. of the Lungs?

(*c*) Becauſe of the groſſer Parts of the perſpirable Matter lodging in the Skin; hence it confirms part of § 13. of Air. And *Hippocrates*, lib. de aer. loc. & aq. pag. 281. & de Morb. Epid. lib. 2. ſays, "It rain'd "much during the exceſſive Heats, and continually, "but more with Southerly Winds. Under the Skin "were thin, ſharp Humours, which, being confin'd, "grew hot, and caus'd an Itching; after which, Puſtles "broke went away in about a Week, and a Jaundice follow'd, and œdematous Swellings in the Feet.

About this Time alſo appear'd ſome Peripneumonies, with a ſlow Fever, a great Difficulty in Breathing, a ſeeming Weight of the Lungs, a Looſeneſs (*d*), difficult Expectorations, a weak and languid Pulſe; the Blood was but little inflam'd, the Urine yellow, with little Sediment (*e*). We muſt take Notice, that in whatſoever Diſtemper any laboured, they complain'd of a Vertigo, Torpor, Drowſineſs, a Heavineſs in the Head, and Dulneſs of Hearing (*f*).

About

" broke out, like what comes upon a burnt Part, and " occaſion'd a Senſe of Burning underneath." After theſe two moiſt Years, which have almoſt continually relax'd and weaken'd the Tone of the Fibres, we might expect ſuch Diſeaſes would ſhow themſelves as are mention'd in § 13. pag. 17. of the Introduction.

(*d*) *Hippocrates*, de Epid. Lib. 3. ſays, " In near ſuch " a State of Air as this, it brings on Diſorders of the " Belly."

(*e*) Do not theſe Symptoms ſhow a diminiſh'd Perſpiration, and a Laxneſs of the Veſſels? And do they not confirm part of § 13. of Air? As alſo part of the 16th Aph. Lib. 3. of *Hippocrates?*

(*f*) The ſame Symptoms happen'd in 1721; and do they not confirm what I ſaid in § 13. of Air? *Hippocrates* obſerv'd

About the End of *September* appear'd the Meaſles, but of a kind Sort, which laſted all Winter (*g*).

January *ſharp and froſty.*

The Beginning of *January* was very ſharp and froſty, with much Snow; the Spirits in the Thermometer ſtanding at 85; which continu'd to the End of the Month. During the Froſt, the ſame Diſtempers appear'd as in the Winter 1715, and as about it's Diſſolution (*h*). The Winter, as well as the Summer, was healthy, except a few feveriſh Diſorders in the Froſt. We muſt obſerve, that they who labour'd under any hypochondriac and melancholic Diſorder, not only were ſenſible of the daily Moiſture, but the Symptoms were much increas'd the following Spring.

The inflammatory Diſtempers which appear'd in the Froſt, vaniſh'd with the Froſt;

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obſerv'd the ſame, Lib. 3. Aph. 17. pag. 1247. and de Epid. Lib. 1. Sect. 2. Year 2. was like this, and the Sick were comatoſe: Alſo in Lib. 3. de Epid.

(*g*) May not this be owing to a leſs inflammable State of Blood?

(*h*) *Vid.* § 12. of Air.

Froſt; but yet, ſome that were before the Froſt remain'd, and continu'd to the Spring, which ſeem'd to take their Riſe, as well from the Moiſtneſs of the Summer, as from the Coldneſs of the Winter; ſuch as Peripneumonia Notha, with a ſlow Fever; a ſoft Pulſe, with a great Difficulty of Breathing: This chiefly ſeiz'd old, cachectic, indolent, pituitous People; more eſpecially thoſe, who indulg'd themſelves in plentiful Eating, and drinking generous Liquors, or ſtrong Malt-Liquors: And they who had not this Diſtemper, had a pituitous Cough, and an Uneaſineſs in the Head (*i*); and even the younger Sort who had it, were either of a leucophlegmatic, hydropic, or aſthmatic Conſtitution (*k*).

In February *cold Rains, Snow, and Froſt alternately.*

When the Froſt diſappear'd at the End of *January*, there fell cold Rains, Snow, and

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(*i*) Do not theſe confirm § 13. of Air?

(*k*) Are not the relax'd State of the Veſſels of the Lungs, their leſſen'd Perſpiration, and their Inflation, the Cauſe why the Blood circulates more difficultly thro' the Veſſels; and why they are troubled with ſo much Phlegm? For upon the coming of the Cold, which contracted the Veſſels, the Lungs ſuffer'd ſo much more than other Parts.

and Froſt alternately, with Southerly Winds; which continu'd to the End of *February.*

The Meaſles appear'd through the whole cold Seaſon; and about this Time, *viz.* the End of *February*, the Air was warmer, they were afflicted with a greater Difficulty of Breathing, and a worſe Cough; and ſometimes with pleuritic Pains (*l*) and a Looſeneſs; but proper Care not being taken, many Children fell into incurable Phthiſes. About the End of *February*, the Weather was clear and pleaſant, and the Heat increas'd as Summer approach'd.

1726, May *hot and dry, with South and Weſt Winds.*

§ 14. In *May* 1726, the Air was hot and dry, with Southerly and Weſterly Winds. About this Time, ſome Remittents and Intermittents appear'd, eſpecially the former; in many with Itchings and cutaneous Eruptions; which alſo happen'd

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(*l*) May not this uncommon Stubbornneſs of the Cough, and the Pains in the Sides, be owing to the Sharpneſs of the preceeding Seaſon? For, during the Cold, the Veſſels of the Trachea and Lungs were contracted, but now were ſuddenly relax'd, and then the Humors were turgid.

happen'd to others, who had no Fevers. They who had Fevers at this Time, complain'd of an acute Pain and Dulneſs in the Head, and were liable, upon the leaſt Error, to become phrenitic.

Some inflammatory Diſtempers alſo appear'd, as Pleuriſies, Peripneumonies, Quinſies, Spittings of Blood, and ſuch like (*m*); but more eſpecially Head-aches more than the reſt, and Inflammations of the Eyes (*n*).

It may not be improper to mention the Effect of this Seaſon in the hypochondriac and melancholic Perſons; ſome were eas'd, others had the Symptoms increas'd, and others were mad. Theſe different Effects of this hot and dry Seaſon, as it ſeems to me, aroſe either from the different Degrees or Stages of the Diſeaſe, or from the different Temperaments of the Sick, *viz.* the hot and dry, or the cold and pituitory: For while the Diſtemper is freſh, without fix'd Obſtructions,

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(*m*) Does not this confirm Part of § 11. of Air?

(*n*) *Hippocrates* ſays the ſame, Lib. 3. Aph. 7.

ſtructions, and the Sick not very pituitory, the Humours then were by the warm Seaſon diſſolv'd, the Body was enabl'd to perform its Functions, and the Sick recover'd: But others, whoſe Obſtructions were rivetted, were worſe by the Rarefaction of the Humours and their Circulation.

In this Summer the Small-Pox appear'd again, which laſted 'till Winter; they were moſtly of the confluent Sort, but not ſo bad as in 1723; theſe, as well as other Fevers, affected the Head very much.

June and July *wet and moiſt, with chiefly North Winds.*

This warm and dry Seaſon laſted to *June*, then chang'd to a wet, moiſt Seaſon 'till the Beginning of *Auguſt*, moſtly with North Winds. Remittents and Intermittents yet remain'd, but fewer in Number.

About the Beginning of *July* Diarrhæas, Dyſenteries, Cholera Morbus, and other Diſeaſes afflicting the Stomach and

Bowels, appear'd (*o*), and laſted to the Middle of *Auguſt*; the Beginning of which, was again pleaſant and warm, which laſted to the Beginning of *September*; from that Time to the End of *November* the Weather was changeable, rather inclin'd to Cold and Moiſt.

August *pleaſant and warm*, September, October, November *changeable, rather inclinable to cold and moiſt.*

Few Diſtempers ſhow'd themſelves, except what are common at this Time of the Year, ſuch as pituitous Coughs, aſthmatic Uneaſineſſes, and ſome chronic Diſtempers.

In the Beginning of *December* fell ſome Snow, with a ſharp Froſt, and a Weſterly Wind, which laſted to *Chriſtmas*; the Mercury in the Barometer was high, the Spirits in the Thermometer fell to 80. During this Seaſon, Pleuriſies, Peripneumonies, and other inflammatory Diſtempers, aroſe, as was mention'd in the like Seaſons before; it was alſo fatal to phthiſical and weak, hectical People, by increaſing the Pains in the Side and Diarrhæas.

Moſt of December *was a ſharp Froſt.*

(*o*) Do not theſe confirm Part of what I ſaid in § 13. of Air?

The reſt of Winter cold, but inconſtant in other Reſpects.

The reſt of the Winter was very cold, but in other Reſpects very inconſtant; ſometimes Snow fell, at others, Rain or Froſt alternately (*p*).

At this Time the Small-Pox diſappear'd in Town, though not ſo ſoon in the Neighbourhood; but the Symptoms were more ſevere, as the Winter approach'd, and during the Froſt, than in the Summer (*q*). About the End of *February* the North Wind blew conſtantly, and then rag'd Pleuriſies, Peripneumonies, Anginas, Rheumatiſms, Podagric and arthritic Pains, convulſive Coughs (*r*), from a ſharp Serum vellicating the Larynx,

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(*p*) *Hippocrates* de Epidem. Lib. 6. § 7. ſays, in much ſuch an unſettled Seaſon, *viz.* "About the Winter Solſtice, from the frequent changing of the Southerly and "Northerly Winds, and Snowy Weather, Coughs, ſome "of which laſted but a little Time, others longer; and "were ſucceeded by Peripneumonies, Inflammations of the "Throat, Quinſies, Palſies, Nyctalopia, eſpecially a- "mong Children, Swellings of the Glands, and Oph- "thalmies."

(*q*) Is not the cold Seaſon the Cauſe of thoſe ſeverer Symptoms, by contracting the Pores, and rendering the Blood more inflammable?

(*r*) *Hippocrates*, Aph. 12. § 3. pa. 1247.

Larynx, and other ſuch like inflammatory Diſorders, with a hard Pulſe.

§ 15. About the End of *March* 1727, the Wind was South, and abundance of Rain fell; the Air was warmer, and the fore-mention'd Diſtempers were more frequent; the Small-Pox appear'd again, and with worſe Symptoms as the Weather grew warmer (*s*).

1727, *The End of* March *was warmer, with Abundance of Rain. This State laſted to the Middle of A*pril, *which was warm and pleaſant.*

This State of the Air laſted to the Middle of *April*, except the South Winds, which now were uncertain, changing from South to Weſt, and thence to North, in 24 Hours; in which Time the Air was colder and moiſter, the ſame Diſtempers remaining.

About the End of this Month, the Weather was pleaſant and warm, with ſome few Showers, but the Winds were uncertain; which State laſted to the Beginning of *May*; during this Seaſon, ſome

Remittents

(*s*) Is not this owing to the ſudden Change of the Air from a cold and dry, to a hot State? For during the Cold, the Blood would be brought into an inflammatory Diſpoſition, and be actually inflamm'd by the ſudden Heat.

Remittents and Intermittents appear'd; the Paroxyſms of the firſt, were uncertain, and altogether irregular; the Urine turbid, and without Sediment, as well in the Remittents as in the Paroxyſms; the Pulſe was quick and weak; the Tongue white and moiſt, and the Sick complain'd of a Lowneſs of Spirits.

But in thoſe Sick, where there were regular Paroxyſms, and a perfect Apyrexy follow'd, the Sediment was ſeldom lateritious, but moſtly whitiſh, inclining to yellow. Pains in the Side attended the Sick, and the irregular Paroxyſms; and as they increas'd, ſo did the Pains; but upon the Decline of the Paroxyſms, they were more mild, but ſeldom quite abated.

True Pleuriſies and Peripneumonies were very rife, as well as the fore-mention'd Symptomatic, but differ'd in the Degree of Inflammation, from thoſe of the preceeding Winter, and Beginning of Spring; for the Blood was leſs inflam'd (*t*); and the inflam'd Pellicle was either very thin, or was wanting; nor were they ſo much eas'd by Bleeding as before. The Pulſe commonly was ſoft and quick, yet very uncertain and variable: But the Pains in the Sides were moſtly fix'd and immoveable; the Spirits faint, and the Sick were weak and languid (*u*). The intercoſtal Muſcles were firſt ſeiz'd, and frequently, when the Diſtemper grew worſe, it affected the Lungs, and rather ſeem'd to be a ſlow Peripneumony, than an inflammatory one, into which it often chang'd.

From the Middle to the End of May *colder, with much Rain.*

Before the Middle of *May*, the Air was colder, and abundance of Rain fell, and it was colder than uſual at this Time of the Year; the Winds were uncertain, but moſtly from the North; this continu'd through the Month, except a few Days.

Diſtempers

(*t*) Is not this owing to the more relax'd State of Fibres, in this warm, pleaſant Seaſon?

(*u*) Do not theſe confirm Part of § 16. of Air? And do they not proceed from a great Relaxation of the Fibres?

Diſtempers remain'd the ſame, but with this Difference, that the Sick, whether in Intermittents or Remittents, were more afflicted with pleuritic Pains in the cold, than in the hot Weather (*w*).

Unſettled to the Middle of July.

The Temperature of Air from the Spring and Beginning of Summer, to *July*, was very unſettl'd and changeable; as well with Reſpect to Heat and Cold, as to the Winds, which were perpetually changing, inſomuch that they were ſeldom two Days alike, and were ſometimes very cold and ſtrong.

Then was much hotter to September.

About the Middle of *July*, the Air was much hotter; the Spirits in the Thermometer riſing from 45 to 25 Degrees.

In this Month, ſome few putrid Fevers appear'd, but the Remittents and Intermittents rag'd moſt, and cutaneous Eruptions often accompany'd thoſe Diſtempers,

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(*w*) Does not this depend upon a greater Denſity of Blood in a cold, than in the hot Seaſon?

ſtempers (*x*), ſometimes of a brown Colour, which were always dry; others were full of a pellucid, ſcorbutic Serum, which itch'd very much. Theſe different Species of Eruptions ſeem to be owing to the different Tenacity, and Volatility of the perſpirable Matter; or from the Difference in the Orifices of the Veſſels, and Thickneſs of the Cuticle.

At this Time, the above-mention'd Remittents were not only more frequent, but accompany'd with worſe Symptoms than in the preceeding Spring; for in the few firſt Days, they ſeem'd like putrid Fevers; but afterwards remitted and chang'd into Tertians, or rather Hemitritæans. The Sick at this Time, were ſleepy and ſtupid, eſpecially in the Paroxyſms; and complain'd of a Wearineſs, Weakneſs, and Lowneſs of Spirits; which Symptoms accompanied the putrid Fever, but in a greater Degree.

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(*x*) Is not the cold, moiſt Temperature of Air, the Cauſe of this, by retaining the perſpirable Matter, which, upon the coming of the warm Weather, guſh'd out? And does nos this confirm Part of what I ſaid in § 12. and § 13. of Air?

The Tongue was moſtly dry and brown, the Pulſe quick and weak; Urine red, and without Sediment; but in Remittents after the Sweat, whether it came on it's own Accord, or by taking a large Quantity of Diluents; they often had a little Looſeneſs, and the Urine depos'd a reddiſh, yellow Sediment.

Languid and hyſteric People who had this Diſtemper, had their Nerves very much affected, and a great Fluttering of Spirits; the Fever laſted longer, and went off without any ſenſible Criſis (*y*).

This State of Air and Diſeaſes continu'd to *September*, except a few Days in *July*, when the Winds were Northerly, with Rain, and for ſome Days, the Air was colder; but ſoon chang'd as abovemention'd. At this Time, Looſeneſſes, Gripings, and Cholera Morbus appear'd, which kill'd ſome, but vaniſh'd in two or three Weeks Time (*z*). The Autumnal Seaſon

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(*y*) Does not this confirm Part of § 11. of Air?

(*z*) Do not theſe confirm Part of § 12. and § 13. of Air?

Seaſon in *September* and *October* was cold and moiſt, and Intermittens were very rife, eſpecially Quartans.

September *and* October *cold and moiſt.*

About the End of *October*, the Wind was North, the Weather cold and froſty; the Spirits in the Thermometer deſcended to 75: This State of Air, though it did not laſt above 14 Days, yet was bad for thoſe, who were weaken'd by frequent Intermittents; for many of 'em had ſevere Pleuriſies, Peripneumonies, and Quinſies, but more eſpecially the former.

Froſt, with North Wind; for a Fortnight.

Remittents, after the Coming of the Froſt, diſappear'd; but not the Intermittents, for Quartans were more frequent, and ſeiz'd almoſt all the common People: But when the Froſt went, and the Weather was cold and moiſt, then Intermittents of all Kinds rag'd much; ſo that it was hard to ſay, which Species was moſt ſtirring.

Cold and moiſt.

About the Middle of *December*, it froze hard for three Weeks, and *January* was very cold and ſnowy, with North Winds.

Middle of December *a hard Froſt for three Weeks;* January *cold and ſnowy, with North Winds.*

Winds. This cold Seaſon, as well as the former, chang'd many Tertians into Quartans, and brought ſome true Peripneumonies, but of the ſlow Sort; and alſo a Difficulty of Breathing in pituitous and aged People; but to the younger Sort, Pleuriſies, as well ſymptomatic as true; eſpecially afflicting thoſe more than others, who had Intermittents before. In many of theſe, the Pains of the Sides depended upon the Intermittents, and like them, begun and ended with the Paroxyſms; and that more regularly, than the Spring before.

Moſt of February *warm for the Seaſon.*

The greateſt Part of *February* was warm for the Seaſon, in which Time, pleuritic Pains, and Cephalalgias attended the Paroxyſms of the Intermittents more than before, and the Fever was very prone to bring on a Delirium. About this Time, many Quinſies, accompany'd with Suffocations, appear'd; which, if not immediately reſolv'd, were fatal (*a*).

§ 16. The

(*a*) May not this proceed from the Blood being rareſy'd, by the increas'd warm Weather?

§ 16. The ſame Diſeaſes continu'd in *March*, at which Time, the Weather was inconſtant; but yet as warm as in other Years. About the End of this Month, Quartans, which had continu'd through Winter, chang'd into Tertians and Quotidians; amongſt which, ſome Remittents appear'd; eſpecially in the next Month; the Beginning of which, was warmer than uſual: In a little Time warm continu'd Rains fell, and laſted 'till *May*, after which, the Weather was hot.

1728, March *warm, but in other Reſpects inconſtant.*

Beginning of April *warmer than uſual, with warm continued Rains.*

A little after this, putrid Fevers appear'd again *(b)*; the Symptoms were in the

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(b) Does not the Succeſſion of theſe Fevers amongſt themſelves ſhew their Nature and Diſpoſition to be the ſame, according to the increas'd or decreas'd Heat, as well in different Years as in different Seaſons of the ſame Year? For their Differences moſtly depend upon a leſs Fluidity of the Febrile Lentor, and a ſlower, languid Circulation in a cold Seaſon; and upon a fluxile State, a quicker Circulation, and perhaps a greater Quantity, Acrimony, and Putrefaction in a hotter Seaſon; for during a hot Seaſon, a putrid Fever reign'd, as in the Years 1718 and 1719; but that decreaſing, it was chang'd into an Intermittent; and by the Winter's Cold into a Quartan. By Parity of Reaſon, as the Spring approach'd, Intermittents begun again; and as the Heat increas'd, became more like continu'd Fevers, which by the Acrimony, Volatility, and Putrefaction of the Matter, produc'd putrid Fevers. This

the Beginning mild, kindly, and did not ſeem in the leaſt dangerous, but often with bad Events; nor did the Pulſe differ much from the natural State. The Urine was not ſo red as in the former Year;

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is ſtill more confirm'd, in that the nearer to perfect Intermittents the Fevers are, and the longer the Intervals betwixt the Paroxyſms are, the ſtronger Diſſolvents, *cæteris paribus*, they require; *& vice verſa*, as well in Remittents, as Intermittents, Quotidians, Tertians, and Quartans. *Hippocrates*'s Obſervations made in his Epidem. § 2. Year the 2d, ſeems to be of a Piece with this; for he ſays, "That in that wet, cool Seaſon, there were few ardent "Fevers, and them not bad; for they were neither ſeiz'd "with a Delirium nor Bleedings; Tertians were more "frequent than Ardents, and were more troubleſome; "Quartans, Quotidians and Erratics were likewiſe frequent." And in Lib. de Humoribus, pa. 50. lin. 27. he ſays, "If the Summer be like Spring, Fevers will "be of a kind, good Sort; neither very acute, nor attended with dry Tongues. But in dry Summers ardent Fevers are very rife;" as we ſee in Lib. 2. § 3. de Epidem. And does not the Obſervation, that the Inhabitants of hot Countries are more ſubject to ardent and putrid Fevers, than thoſe of a colder? And that the Inhabitants of a colder Climate are more ſubject to Remittents and Intermittents, alſo confirm this Opinion? Does not *Boerhaave*'s Experiment upon the Dog, mentioned in § 11. of Air, confirm it alſo? Is it not apparent why the firſt Kind, infeſt a hot, dry Seaſon; the latter, a colder? And alſo why, upon the Heat decreaſing, ſo do putrid Fevers; and then the others increaſe? Is it not alſo apparent, why putrid, ardent, and continued Remittents, ſometimes on their own Accord, change into Intermittents? And hence does it not appear, why Spring Intermittents often end of their own Accord, as the Heat increaſes? But the Autumnal, by the Winter's Cold, become worſe? Becauſe by the firſt, the Lentor is diſſolv'd; by the laſt it is increas'd.

Year; in ſome it was turbid, but in others with a whitiſh, yellowiſh Sediment; it grew pale, as the Diſtemper grew worſe. The Sick ſweat for the moſt Part about the Face and Breaſt, whilſt the reſt of the Body was hot and dry; and in the End, the Aphthæ affected the Palate and Mouth. Theſe Symptoms increas'd daily, with a Delirium about the 12th Day; with thin Urine, a weak, frequent, and unequal Pulſe; to which ſucceeded Tremblings, Collectio floccorum, and other Fore-tellers of Death. It is worthy of Obſervation, that ſome, at the Beginning of the Fever, had a Vomiting and a plentiful Looſeneſs; theſe all ſoon recover'd; for by theſe Means the Fever was either abated, or chang'd into an Intermittent. At the ſame Time appear'd a Fever like this, except that red Spots, not unlike Flea-bites, and variegated like Marble, appear'd on the Breaſt; and before the Eruption of the Spots, was a purſy Difficulty of Breathing; but when they appear'd, it was eaſier: In many of theſe People, the Head ached, in which, there often was ſome Blood came from the Noſe, which ſometimes was thrown out by Stool, but that was ſeldom.

June *hot and dry, and Weſt Winds.*

In *June*, the Weather was hot and dry, with a little Wind, and that from the South and Weſt. The putrid Fever ſtill remain'd, and Remittents were very much ſtirring; and many of thoſe, who had Intermittents in the preceeding Winter and Spring, labour'd under hectic Fevers, with nocturnal Sweatings, Watchings, wandering Pains, and a Languor of the whole Body.

Middle of July *was cooler, Wind North, with ſome Rain.*

About the Middle of *July*, the Air was cooler, the Spirits in the Thermometer deſcended to 45 Degrees; the Wind chang'd from South to North, and ſome Rain fell. At this Time, Pleuriſies and Quinſies above deſcrib'd return'd again, and Intermittents more frequently return'd, afflicting thoſe chiefly, who had had 'em the Autumn and Spring before.

Auguſt *dry, but cooler than uſual.*

The dry Seaſon return'd again about the End of the Month, and laſted all *Auguſt*, but was cooler than uſual at this

Time of the Year. The putrid Fever remain'd yet, but with ſomewhat different Symptoms, as well from them, which appear'd in the Beginning of Summer, as from thoſe of the preceeding Year. For the Sick was ſeldom ſtupid and drowſy (*c*), as in the former Year; though the Urine was not ſo turbid, as in the latter Fever; the Pulſe for the moſt Part was ſtronger, they were more delirious, and the Sick were more outrageous. At the ſame Time, Remittents were very rife, with the ſame Changes of Symptoms as are mention'd in the putrid Fever: They, at laſt, were chang'd into Intermittents; and according to the Strength of the Sick, and the various Degrees of Inflammation, were chang'd into Quotidians, Tertians, or Quartans.

(*c*) Does not this ſhew the Effects of the Difference of the Seaſons; how that in a moiſt Seaſon, People are ſubject to Dulneſs, Stupidity, Pleuritic Pains, *&c.* but in a dry Seaſon, to a Delirium in a more outrageous Manner? And are not Theſe owing to a greater Strength, or Elaſticity of the Veſſels, in a dry, than in a moiſt Seaſon, according to § 13. of Air? Does not theſe agree with what old *Hippocrates* ſays in ſeveral Places?

September *cold North Winds.*

The Cold increaſing in *September*, with Northerly Winds, the Seaſon was more healthy (*d*): The putrid Fever vaniſh'd, and the Remittents were fewer; but the Intermittents remain'd as frequent as before, accompanied with greater Coldneſs, with rheumatic and pleuritic Pains in the Paroxyſms; but they went off with the Fever. This State of the Air and Diſeaſes, laſted almoſt through *October*, to which ſucceeded Plenty of Rain, with a warm South Wind; which State continu'd to the End of *November*.

The End of October *and* November *warm, with a South Wind and Rain.*

At the End of November *a hard Froſt two Weeks, with ſome Snow.*

This Seaſon was very healthy, few Diſeaſes appearing, except Intermittents. But about the End of the Month, the Wind chang'd to North; and it froze very hard for two Weeks, in which Time, ſome Snow fell. The Spirits in the Thermometer firſt fell from 56 to 76, and ſoon after to 80. This Change brought on Gripes, Looſeneſſes (*e*), and pleuritic Pains

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(*d*) Does not this confirm what we ſaid before about the Change from one Fever to another?

(*e*) Is not this owing to a cold, ſucceeding a warm Seaſon?

Pains in the Paroxyſms of Intermittents (which were only few) and alſo ſome Apoplexies, and Palſies, eſpecially about the Thaw.

About Chriſtmas *a cold Froſt, with Snow, for a Month.*

About *Chriſtmas* the Froſt return'd, with much Snow, and continu'd about a Month, with great Cold; producing the ſame Diſtempers as mention'd in 1715, in that froſty Winter. No Remittents appear'd, and but few Intermittents; but as ſoon as the Froſt went, Intermittents begun again, frequently accompanied with pleuritic Pains in the Paroxyſms. Many Pleuriſies, Quinſies, and Peripneumonies, as well Nothæ as the true; ſeizing as well thoſe in Health, as thoſe, who in the Summer or Autumn had had Intermittents, and kill'd many of the common People.

February *very cold, with Snow and a hard Froſt,*

February was very cold, with much Snow, and a hard Froſt; but not ſo cold as the laſt Month. The ſame Diſtempers continu'd; but we muſt obſerve through the whole Winter, that the warmer and pleaſanter the Air was (*f*), the more frequent were Intermittents, and approach'd nearer to the Species of continu'd Remittents, and *vice verſa.* And alſo, that the ſharper and colder the Seaſon was, the more rife were inflammatory Diſtempers; and the Intermittents in the Paroxyſms very much reſembl'd theſe.

§ 17. *March*

(*f*) Does not this yet further confirm what was ſaid before about the Change from one Species of Fevers to another, *viz.* that it is owing to the various Degrees of Heat and Cold in this Seaſon, as well as in the preceeding Autumn and Summer? And does not this ſolve that difficult Problem, Why Epedemics, alike in their Nature, ſhould be often found in Temperatures of Air very unlike? For that Temperature of Air, which appear'd cold in Summer, which then ſtrengthen'd the Fibres and condens'd the Blood; in Winter, feels warm, relaxes the Tone of the Fibres, and rarefies the Blood. It was this Phænomenon that induc'd Phyſicians to ſuſpect and conclude, that Epidemics ow'd their Riſe to ſome hidden Quality of Air: We here mean only common, not peſtilential and contagious Epidemics. *Hippocrates,* de Epidem, Lib. 2. pag. 997. and in Aph. 8. Lib. 3. ſays, "In conſtant and ſettled Seaſons, if the Things that are ſeaſonable appear "ſeaſonably, the Diſeaſes will be of a good ſort, and "eaſily determin'd; but in irregular Seaſons, they will "be alſo irregular, and determin'd with Difficulty." And again, in Lib. de Humorib. pag. 50. lin. 13. he ſays, "What the Diſeaſes of any Seaſon will be, and the Na-"ture of the Conſtitution of them, may be thus known; "If the Seaſons are natural, and well regulated, Diſeaſes "will come to a Criſis with Eaſe: And if the Diſeaſes "are proper to the Seaſons, the Manner of 'em is evi-"dent: If the Seaſon changes, the Diſeaſes will change "alſo."

§ 17. *March* was dry and cold, with Northerly Winds; which laſted to the End of *April* 1729, inſomuch that the Spring was more like Winter, than the Spring. In this Seaſon Chin-Coughs were almoſt innumerable, Quinſies, Peripneumonies, Pleuriſies, Rheumatiſms, Cephalalgias, Ophthalmies, Eriſypelatodes, Itchings, and cutaneous Eruptions were all very riſe (*g*). Some few Intermittents appear'd, as well regular as anomalous, and theſe moſtly of the Quartan Sort: As the Warmth increas'd in the Spring, Tertians and Quotidians were more frequent than theſe; but yet in nothing near the Number of the above-mention'd Diſeaſes.

1729, March *dry and cold, with Northerly Winds.*

In the Beginning of *May*, the North Winds brought abundance of cold Rains, which laſted to the Middle of the Month; from which Time, the Weather was warmer, but yet in a leſs Degree than uſual, with Eaſterly Winds for the moſt Part.

Firſt Half of May *North Winds, with much cold Rain; the latter Half warmer, but in a leſs Degree than uſual.*

(*g*) Are not all theſe owing to a cold State of Air, as mentioned in § 12. of Air?

Part. Inflammatory Diſtempers continu'd almoſt all *May*, though leſs frequent; yet as the Heat increas'd, they decreas'd, and at length, in the Beginning of *June*, they almoſt quite vaniſh'd (*b*).

June *and* July *hot and dry, and alſo* Auguſt, *to the Middle of* September.

June was hot and dry, except a few Days, about the Middle of the Month, in which ſome cold Rains fell: This hot State laſted to the Middle of *September*, except about the End of *July* it rain'd ſome Days.

This Seaſon was healthful to the End of *Auguſt*; about which Time, Remittents and Intermittents begun to rage again, and ſeiz'd many; which latter, becauſe of the long and double Paroxyſms, ſeem'd a Species of continu'd Fevers, but at length were turn'd into regular Intermittents. We muſt obſerve, that theſe Fevers ſhow'd themſelves later this Year than uſual; very likely, becauſe the

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(*b*) Is not this owing to the Warmth, which relaxes the Veſſels, as mentioned in § 11. of Air, whence the inflammatory Diſpoſition of the Blood would decreaſe alſo?

the cold Seaſon laſted to *June*. Whence it alſo happen'd, that notwithſtanding the Seaſon was ſickly, yet ſcarce any putrid Fevers appear'd (*i*). About this Time, Chin-Coughs ſeiz'd many Children, with great Suffocations, and a great Quantity of Phlegm; eſpecially about the Coming of the ſucceeding Seaſon. The Approach of Winter produc'd the ſame Effect in Remittents, as was mention'd before; yet Intermittents remain'd, though fewer in Number.

The moiſt Seaſon began about the Middle of *September*, with Southerly Winds; which State, except a few Days, laſted to the Middle of *December*, and was more wet and cloudy than all the other, as appear'd by the Barometer and Hygroſcope. In this Seaſon a little Fever appear'd, almoſt ſeizing all with a little Shivering, Laſſitude, almoſt a perpetual (*k*) Cough, Hoarſeneſs, Pains in the

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(*i*) Does not this confirm what I ſaid in Note (*b*) § 1[illegible] of this Chapter?

(*k*) *Hippocrates* ſays, in § 3. Aph. 13, 14. pa. 1247. " If the Summer be dry and northerly, and the Autumn " ſhowery the Head, and Difficulty in Breathing; all which Symptoms, in the Robuſt and Healthy, ſoon vaniſh'd, without any great Inconvenience: But it afflicted the ſickly People very much, eſpecially the conſumptive, cachectic, old, pituitous, bulky People, and they who had Intermittents; for in theſe People, it brought on Pleuriſies and Peripneumonies, which ſoon ſuffocated, and ſuch like Diſtempers, which kill'd many.

Hyſteric and hypochondriac People were at this Time very bad, and many of 'em labour'd under Vomitings, flatulent and diſtending Pains in the Stomach and Bowels (*l*).

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" ſhowery and ſoutherly; Head-aches and Paralytic Diſ-" eaſes are like to happen in Winter; and with theſe, " Hoarſeneſſes, Stuffings in the Head, Coughs, and in " ſome Perſons Conſumptions: And if it be northerly " and dry, it agrees very well with moiſt, phlegmatic " Conſtitutions, and with Women." Theſe Symptoms, as we obſerv'd before, generally attend Fevers and other Diſtempers in a cold, moiſt Seaſon; and we find it confirms Part of § 13. of Air. May they not be owing to thoſe Parts being more expos'd to the external Air, than the others? And may they not be more ſevere, becauſe the Air chang'd from a dry to a moiſt State?

(*l*) May not theſe Pains ariſe from an obſtructed Perſpiration?

The languid and aged People were ſeiz'd with rheumatic and arthritic Pains, rather a Colluvie Seroſa, than from any Acrimony of the inflammatory Matter, as appears by the œdematous Swellings, and ſlow Pain.

Some at this Time had a ſlow Fever, with a ſoft Pulſe, Pain and Heavineſs of the Head, wandering Sweats, a Languor of the Spirits, and turbid Urine; it ſometimes went off in Sweats, ſometimes with a Diarrhæa; but moſt frequently turn'd into an Intermittent. This Diſeaſe ſeem'd to belong to the Claſs of Remittents, although it underwent ſome certain Variations, occaſion'd by the Difference of the Seaſon of the Year, and the State of the Weather; by which means, the weak Pulſe and Weight of the Head ſeem'd to be brought about; becauſe they, who were in other Reſpects in Health, were thus affected (*m*), as

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(*m*) Does not this confirm Part of what I ſaid in § 1[illegible] of Air?

as well as they, who were in Fevers. The Sick, in whatſoever Diſtemper, had always a perpetual Cough, a Pain and Heavineſs in the Head, Stupor and Drowſineſs. The Small-Pox appear'd here and there, but of the kindeſt, and moſt diſtinct Sort I ever ſaw (*n*).

The moiſteſt Seaſon I ever ſaw, except this, was in 1715. But that was attended from the latter End of Spring almoſt thro' all Summer, with Northerly Winds; the Air was cooler than uſual; and as to the Coldneſs, not unlike the Spring; yet it was not unhealthy, few Diſtempers then appearing; perhaps, becauſe this State differ'd but little from the foregoing, and becauſe the Moiſture help'd a little to relax the Veſſels, which the North Wind contracted. But this Conſtitution of Air begun in, and continu'd through all Autumn and Beginning of Winter; the foregoing Seaſon being hot and dry, and the Winds were Southerly; all which would relax

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(*n*) May not this be owing to the Moiſture relaxing the Veſſels and the Pores, thereby letting the Matter out with more Eaſe and leſs Danger?

relax the Veſſels the more. We muſt obſerve the Effect of the daily Moiſture in both Conſtitutions, although in a different Degree, by Reaſon of the paſt Seaſon and the increas'd Cold; for in both Seaſons there was a ſlow Fever, with a Cough, a Heavineſs in the Head, a Stupor, Drowſineſs and Deafneſs; the Lungs were oppreſs'd with Phlegm; hyſteric and hypochondriac Paſſions raged much; and the inflammatory Diſeaſes that appear'd, were milder, and of a kinder Sort.

Chriſtmas *was clear and pleaſant, with South Winds.*

About the Middle of January *cold, with North Winds, and ſome Snow. From that Time to the End of* February, *warm again. Beginning of* March *North Winds, Snow, and cold Rains in Abundance to the Middle of* March.

About the Middle of *December*, the Rains decreas'd gradually 'till *Chriſtmas*, when it begun to be pleaſant and clear, with gentle South Winds; ſo that it was more like Spring, than Winter, little Froſt having yet appear'd, and no Snow. A little before the Middle of *January*, the North Winds blew, the Air was cooler, and a little Snow fell; but the other State ſoon return'd, and, for the moſt Part, continu'd ſo to the End of *February*. About this Time, the North Winds return'd again, and a large Quantity of Snow fell; to which ſucceeded cold Rains in Abundance, which laſted to the Middle of *March.*

The latter Part of Winter was not very unhealthy, but kill'd ſome conſumptive and aſthmatic People, as it were, unawares; both the Swelling of Legs (*o*) and Difficulty of Breathing coming upon 'em at once. There appear'd alſo in the cold Seaſon ſome Pleuriſies, and ſome other inflammatory Diſeaſes: The Small-Pox was ſtirring, but of a good Sort; alſo ſome miliary Fevers, petechial Fevers, and Intermittents appear'd, but were not very rife; theſe Intermittents were moſtly irregular, yet chiefly affected the Head with a periodical Pain, or the Breaſt, like a Pleuriſy: The Small-Pox above-mention'd were here and there ſtirring, but vaniſh'd as the Spring advanc'd.

1730, *The End of* April *grew warmer, with a Weſt Wind.*

§ 16. The Weather grew gradually warmer almoſt to the End of *April*, with a Weſt-

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(*o*) Is not this from too great a Relaxation of the Fibres?

a Weſterly Wind. The fore-mention'd Intermittents, and ſome inflammatory Diſtempers, remain'd yet, which latter were fewer than uſual (*p*) at this Time of the Year.

The End of April *and Beginning of* May, *cold and dry, with North Winds.*

About the End of *April*, and Beginning of *May*, cold, dry North Winds blew, which brought Looſeneſſes, Gripings, and ſome Iliac Paſſions (*q*).

Middle of May *hotter, with Showers; thence to* Auguſt *was colder and wetter than uſual; then ſome Weeks of ſerene, pleaſant Weather.*

About the Middle of *May*, the Air was hotter, and ſome Spring-like Showers fell. At this Time, Intermittents were a little more common, which often ended in a Jaundice (*r*); which Diſeaſe was more frequent than uſual, and ſeiz'd others no ways affected with Fevers. This Weather ſoon chang'd, for the Seaſon became

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(*p*) Was not the warm, moiſt Winter and Spring relaxing the Veſſels, the Reaſon why ſo few inflammatory Diſeaſes appear'd, they being fewer than in any of the former Years.

(*q*) Do not theſe confirm Part of § 12. of Air, by the Perſpiration being turn'd inwards?

(*r*) Did not the State of Air in the foregoing Winter, by weakening the Veſſels, make a ſlower Circulation, and a more viſcid State of the Blood? By § 13. of the Introduction, we ſee it is eaſily accounted for.

became colder and wetter than uſual, except a few Days, with North Winds; which State laſted to the Beginning of *Auguſt*; to this ſucceeded pleaſant and ſerene Weather, which laſted ſome Weeks, with Weſt Winds for the moſt Part. All this Summer was healthy, as I obſerv'd before in the wet Summer in 1715; a few Diſtempers only appearing, and thoſe of a good Sort; except in the Beginning of *Auguſt*, ſome had the Cholera Morbus: The Small-Pox and Meaſles were ſtirring in ſome Places in the Neighbourhood; but they ſcarce appear'd in this Town 'till Autumn.

Latter End of Autumn, and Beginning of Winter wet, to the End of November, *then a ſharp Froſt.*

The latter Part of Autumn and Beginning of Winter were wet and rainy, and then the Small-Pox and Meaſles were more common; but few other Kinds of Fevers ſhow'd themſelves, except a ſlow Peripneumony, which appear'd about the Beginning of Winter. The wet State laſted almoſt to the End of *November*, and then was ſucceeded by a ſharp Froſt, accompany'd with Snow and North Winds. About this Time the Mercury in the Barometer roſe ſuddenly (*s*), almoſt to the greateſt Height; and the Spirits in the Thermometer ſunk about 20 Degrees, which State of Air laſted about a Week. This cold Seaſon increas'd the Peripneumonies; and alſo produc'd ſome Pleuriſies, and Diarrhæas, with Gripes; but the Pleuriſies were not ſo common by far, as the Peripneumonies. The Froſt ſoon again return'd, with a little Snow; and again went off gradually, in about the ſame Space of Time. The Small-Pox and Meaſles remain'd, and alſo other Fevers with cutaneous Eruptions (*t*) of no bad Sort, but not ſo good as thoſe in the laſt more mild Seaſon.

Froſt.

In the Beginning of *January* a great Quantity of Snow fell, and the Froſt return'd again, and continu'd to the Beginning of the following Month, except a few

In January *and Beginning of* February *much Snow and Froſt.*

(*s*) This ſudden and conſiderable Change could not fail making conſiderable Alterations in our Conſtitutions; as we may ſee in § 14. of Air; as we obſerv'd before.

(*t*) Does not this confirm Part of § 12. of Air? as we have taken Notice in ſeveral Places before.

a few Intervals. At this Time inflammatory Diſtempers begun to ſtir, and were more virulent; and they who had the Small-Pox, had a worſe Sort (*u*). The Froſt and Thaw were accompany'd with the ſame Diſtempers, as uſual in ſuch a Conſtitution of Air (*w*).

After the Froſt, a Drought, with ſharp North Winds, which continued to the Middle of April.

After the Froſt was gone, the Drought came with ſharp North Winds; at which Time, Pleuriſies began to be riſe, with this Difference from thoſe, which in the Beginning of Winter ſeiz'd the Sick; for theſe ſeiz'd the weak and aged chiefly, and Peripneumonies were more riſe than they; but now true Pleuriſies rag'd, which chiefly ſeiz'd the younger, ſtronger and

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(*u*) Is not this owing to the Cold, which contracts the Fibres and Pores, making the Blood more inflammable? *Vid.* § 12. of Air.

(*w*) Does not this Temperature of Air and that in 1723, compar'd with their Contraries, and the different Diſtempers appearing in each, prove many of the foregoing Queſtions? And does it not appear from the foregoing Series of Diſtempers, why inflammatory Diſtempers, ſuch as Pleuriſies, or the like, ſeldom afflict Women, and other weak and lax Conſtitutions, whoſe Blood is moſtly thin, diſſolv'd and florid; but that they only happen to young, ſtrong, active People, whoſe Blood is more denſe and thick: *Et vice verſa*, why ſlow, nervous Fevers moſtly happen to the former?

and more active Sort. The Diſeaſe was accompanied with a hard Pulſe, and acute Pain, with a thick inflammatory Pellicle on the Blood, and other inflammable Signs. This State of Air was not unlike that in the Winter 1715, except that it was often mild, and the Froſt return'd again, whence the Cold affected the Body leſs, and the Number of Sick were fewer.

§ 19. The Drought, with the Cold, remain'd to the Middle of *April* 1731, at which Time, ſome cold Rain fell, with Eaſterly and Northerly Winds; and the cold Air laſted almoſt to the Beginning of *May*: To this ſucceeded a warm State of Air, with gentle South and Weſt Winds.

1731, *Some cold Rain, with Eaſt and North Winds, to the Beginning of* May; *to this ſucceeded a warm State, with gentle South and South-Weſt Winds.*

Inflammatory Diſtempers laſted the cold Seaſon; yet they were more frequent for ſome Days at the Beginning of the Heat (*x*); and ſome relaps'd, who had recover'd. Many had Cephalalgias,

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(*x*) We obſerv'd before, that inflammatory Diſeaſes were worſe, juſt upon the Change from a Froſt to a Thaw; for the ſame Reaſon, they are worſe in this Change, from a cold to a warm State.

Palſies, and Apoplexies: Some few languid Fevers appear'd, with large Sweats, Sickneſs, Lowneſs of Spirits, and ſometimes were attended with Diarrhæas; which Symptoms tormented the Sick alternately, and ſeiz'd the weak and lax Women above the reſt. Some of theſe, in the Beginning of the Diſeaſe, had a great Looſeneſs, with Gripes; which happen'd chiefly to them, whoſe Bowels had been weaken'd by frequent Diarrhæas, and Pains in the Stomach and Bowels; but the Diſeaſe went off, as in this Month in 1728; at which Time the hot State ſucceeded the cold on a ſudden: But at this Time the Fever was of a kinder Sort, and fewer in Number; perhaps becauſe of a leſs Degree of Heat (*y*).

The Heat abated, but the Drought laſted to near the End of Auguſt, *when ſome ſudden Rains fell.*

The hot State ſoon ceas'd, but the Drought laſted beyond the Middle of *Auguſt*, except a few Days, in which ſome ſudden heavy Rains fell. The Summer, both as to Heat and Winds, was more

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(*y*) Does not this Effect proceed from the foregoing Rigidity of the Fibres, and the increas'd Motion by the Heat?

more changeable than the foregoing, though in a leſs Degree, as appear'd by the Thermometer; which, though it underwent frequent Changes, yet was kept within leſs Bounds. Few Diſtempers appear'd this Summer, but theſe were of the inflammatory Sort for the moſt Part; and gradually decreas'd, as well in Strength, as Number. To theſe were join'd ſome Remittents and Intermittents, ſometimes reſembling inflammatory Diſeaſes, and ſometimes ſlow Fevers; yet theſe were not epidemical, but ſeem'd rather to ariſe from the Weakneſs of Strength of the former; inſomuch that they rarely appear'd, except where the former had preceeded, and even that in their Decline.

Much Rain, with South Winds to September.

To this State of Air ſucceeded large Rains, with chiefly South Winds, which continu'd to *September:* This brought on Cholera Morbus, and Dyſenteries; but theſe neither were frequent, nor appear'd long. This Summer was very dry; but in Reſpect to the Winds, very unlike the Year 1723: But in both we muſt conſider the Effects of the daily Drought in producing inflammatory Diſeaſes, though in a different Degree; for this was not unlike that, as to the Species of Diſeaſes, which were almoſt all of the inflammatory Claſs; yet they ſeem'd to differ much in Degree; inſomuch that they were more mild and more frequent in this, and the Blood was leſs inflam'd; which, perhaps, may be owing to the mild and equable Heat, and the gentle South and Weſterly Winds: For through all the Year 1723, the North and Eaſterly Winds blew, which contracts the Fibres, condenſes the Fluids, and diſpoſes the Humours to an inflammatory Diſpoſition. But in this Summer, neither the Humours were burnt up by Heat, nor the Veſſels were ſcorch'd up by the drying Winds; from whence we may conclude this Year was like 1723; for a wet Seaſon preceeded both, to which ſucceeded a ſharp Winter, and Spring not unlike; all which Seaſons were accompany'd with Diſtempers of the ſame Kind; whilſt the pleaſant and mild Seaſon of this Year, brought a Variety, as well in the Air, as in the Diſeaſes which were ſtirring. A little before the Middle of *September*, the Weather was warm and pleaſant, with South Winds, which laſted almoſt to the End of *November*, and was an healthy Seaſon.

§ 20. We ſee what a Number of Diſeaſes proceed from the manifeſt Qualities of the Air, over and above what ariſe from its occult Qualities; we alſo find that many are caus'd by Effluvia, which diſpoſe to this, or that Diſeaſe; but of them we cannot eaſily, either know the Species they will belong to, nor yet always, whence they proceed. But as to the different Kinds of Fevers, that have been mention'd by the two learned Phyſicians laſt nam'd, they ſeem to be altogether owing to the apparent Qualities of the Air, as we before obſerved in § 16. of this Chapter, in Note (*b*): And is not this ſtill farther confirmed in § 17. at Letter (*i*) pag. 153? For let us only look back, and make a ſhort Recapitulation, and then we ſhall be convinced of what I have aſſerted.

In 1716, the Summer was hot, but not ſo hot as ſome of the following, with Weſt Winds; the Fevers were Remittents, and alſo ſlow nervous Fevers appear'd.

In 1717, the Summer was hot and dry, with South and Weſt Winds. Diſtempers were Remittents, and Intermittents; in the Beginning of the Diſeaſe they reſembl'd the putrid Fevers; but in a few Days an imperfect Criſis appear'd, and then they chang'd into Remittents or Intermittents.

In 1718, the Summer was hot and dry. The putrid Fever call'd συνοχος appear'd.

In 1719, was a dry Seaſon; then appear'd a putrid Fever; the venal Blood was florid and diſſolv'd.

In 1720, was a dry Seaſon, but not ſo hot as in the laſt Year. *Wintringham* obſerv'd, that the Fever accompanied the Heat of the Air, for as the Heat increas'd and decreas'd, ſo did the Fever; and we alſo know, that any Thing will putrefy ſooner in a hot, than in a cold Seaſon.

In 1721, was a cold, moiſt, and rainy Seaſon. Then no putrid Fever appear'd; but the Fevers were rather of the Intermittent Claſs, tho' very different from thoſe of the laſt Year: For the Sick were not delirious in the Paroxyſms, and in the Intervals they had a perfect Apyrexy; they were very ſubject to a Looſeneſs; the cold Fit was greater and longer; the hot Fit more mild and ſhorter. Is it not evident, that the cooler and moiſter State of Air in this, than in the laſt Year, made the Humours more viſcous, and leſs acrimonious?

In 1722, Spring and half Summer was cold, wet and rainy, with chiefly Eaſterly and Northerly Winds. Diſtempers were chiefly Intermittents of the Tertian Claſs, tho' ſome Quartans appear'd, eſpecially among thoſe, who had had frequent Returns of Tertians. Theſe Intermittents would not eaſily yield to the

Bark alone, becauſe of the Patient's Proclivity to a Looſeneſs; but when join'd with Alexipharmics and Diaphoretics, it ſeldom fail'd of Succeſs. Did not the greater Cold and Moiſture in this, than in the laſt Year, make the Humours ſtill more viſcous, and clog up the perſpiratory Veſſels? Hence we ſee the Reaſon of the Want of warmer Medicines to be join'd with the Bark.

In 1723, Summer was dry, but not hot in Proportion; was cloudy, with North and Weſt Winds; which State laſted to the Beginning of Winter. No putrid Fever appear'd this Year: Was not this for want of the uſual Heat? The chief Diſeaſes were of the inflammatory Claſs, as Pleuriſies, *&c.* Are they not owing to the cooler State contracting the Veſſels, and condenſing the Blood?

In 1724, this Summer was wet and cold, with North Winds. The Spring and Summer were exceeding healthy: No putrid or any other bad Fevers appear'd.

In 1725, from the Middle of *April* to *December*, the Weather was very cold and wet for the Seaſon; and in a greater Degree than in any of the former Years. This Summer was more healthy than the laſt. In Autumn a little Fever appear'd with Sickneſs, Nauſea, and Vomiting, to which ſucceeded a troubleſome Itching, and cutaneous Eruptions; and alſo Peripneumonies with a ſlow Fever: Is not this owing to the cold and moiſt Seaſon? Neither a putrid, ardent, nor any other bad Fever appear'd.

In 1726, the firſt Part of Summer was hot and dry, with Southerly and Weſterly Winds. Some Remittents and Intermittents appear'd with Itchings and cutaneous Eruptions: The latter Part was wet and moiſt with North Winds. The Diſtempers chiefly were ſuch as afflicted the Stomach and Bowels, ſuch as Cholera Morbus, Diarrhæas, *&c.* But yet no putrid or ardent Fevers appear'd.

In 1727, we find that in the cold and wet Part of the Summer, Remittents and Intermittents appear'd: But in *July*, when the Air was hotter; then putrid Fevers appear'd; but the Remittents and Intermittents yet remain'd. The Remittents now, at the Beginning reſembl'd putrid Fevers; but afterwards remitted and chang'd into Tertians, or rather Hemitritæans.

In 1728, the Summer was hot, and then putrid Fevers appear'd again, with Remittents: But in *July*, when it was cooler, with a North Wind and ſome Rain; then Pleuriſies and Quinſies return'd; and alſo Intermittents. In Autumn the dry Seaſon return'd again, but yet cooler than uſual: Putrid Fevers remain'd, but with different Symptoms.

1729, An Account of this we have already given.

In 1730, this wet, cool Summer was healthy, no putrid or other bad Fevers appearing.

In 1731, few Diſtempers appear'd, but thoſe were moſtly of the inflammatory Sort; Part of the Summer being much cooler than uſual.

Now, from all theſe Obſervations, we find that Nature has almoſt kept on in a regular Method; which does not only appear from theſe, but alſo from other Obſervations made by the learned Society at *Edinburgh*, and by many others in ſeveral Parts of the World (z); all which, (if carefully and impartially examin'd) I believe, will be found rather to confirm, than diſprove this Conjecture. But this I ſhall now leave to be compleated by a better Pen than mine; and I ſhall proceed to make ſome neceſſary Remarks relating to Epidemics.

(z) *Viz. Bernardini Ramazini*, a Pyſician of *Modena*, publiſhed a Hiſtory of the Conſtitutions of the Years 1690, 1691, 1692, 1693, 1694, and Epidemical Diſeaſes about *Modena*, and the adjacent Countries. Alſo an Epidemical Hiſtory of *Germany*, by ſeveral eminent Phyſicians. The learned Sir *Hans Sloan* has alſo given us a Journal of the Weather of *Jamaica*, and the popular Diſeaſes of that Country.

Epidemical Diſtempers oft ſeize Cattle ſome Time before it affects human Bodies, as that remarkable Epidemic in 1732 did; I ſaw ſome Horſes that fell down and panted for Breath, others died upon the Spot. The ſame was obſerv'd in *Scotland*. *Vid.* Med. Eſſays, Vol. 2. Pag. 32.

Sydenham ſays (*a*), we muſt take Notice, that ſome Diſeaſes in this or that Year are regular, and have the like Phænomena and Symptoms in almoſt all, who are infected with 'em; and go off in the ſame Way and Manner; therefore a true Hiſtory of Epidemics is to be learnt from theſe, as being moſt perfect of the Kind.

Again he ſays (*b*), there is a Variety in Nature, that is of a more nice Speculation, *viz.* that the ſame Diſeaſes ſhould vary often under one and the ſame Conſtitution, as to its Beginning, State, and Decli-

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(*a*) De morb. acut. pag. 5.
(*b*) *Ib.* pag. 6.

Declination; which is of ſo great Conſequence, that the curative Indications are to be omitted or us'd, according as the Diſeaſe is diſpos'd.

Wintringham ſays (*c*), we are (when any Fever begins to be epidemical) diligently to compare the Symptoms of other Fevers with the reigning Epidemics, and duly to weigh, how much of the Epidemic Indoles they have in 'em. For as they, for the moſt Part, depend upon the foregoing, or preſent State of the Air, which is common to both, they can't fail of being alike in the very Eſſence of the Diſeaſe, although they appear to be of a different Species.

He alſo ſays (*d*), that when any epidemic Fever begins, it frequently happens, that they, who are well and about their Buſineſs, begin to find themſelves a little out of Order for a few Days; which Diſorder either goes off by Stool, Vomiting,

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(*c*) Comment. Notolog. pag. 59.
(*d*) *Ib.* pag. 125.
(*e*) *Ib.* pag. 156.

Vomiting, or by Sweat, which happen on their own Accord. Theſe critical Evacuations, though they be different, in different People, yet they often ſhow the Indoles of the Epidemics, which are about to come; and alſo ſhow which Way, above others, Nature endeavours to throw out the febrile Matter, and to eaſe the Sick: This he obſerv'd to be ſo conſtantly true, that he ſcarce could recollect any Synochus being epidemical, in which Nature did not ſhow itſelf after this Manner. *Vid.* 1729. Again he ſays (*e*), that the more ſudden the Change is from one Extreme to another, with the greater Force it affects our Bodies, and brings worſe and more Diſeaſes; and *vice verſa.* This is much the ſame with *Hippocrates*'s Obſervation, for he ſays (*f*), "The Changes of the Seaſons "are the moſt productive of Diſeaſes, "the greateſt Changes eſpecially."

We muſt obſerve, that when any Epidemic is riſe, whatſoever Illneſs we labour

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(*e*) Comment. Notolog. pag. 156.

(*f*) Lib. de Humorib. pag. 50. lin. 55.

bour under, for the moſt Part, is attended with the ſame Symptoms as the Epidemics are; as we may ſee in ſeveral Parts of this Chapter, *viz.* 1725, 1729, from *September* to *December.*

I wiſh *Sydenham* and *Wintringham* had given an Account of the Full and Change of the Moon in each Month, which would ſhow us what Influence ſhe has in increaſing and decreaſing our Diſeaſes. I hope Obſervators for the future will do it.

We muſt obſerve, that the Small-Pox are mild, and of a more diſtinct Sort, in moderate, warm, moiſt Seaſons, and *vice verſa.* For in *January* and *February* 1715, the Weather was cold, froſty and ſnowy, with South Winds; the Small-Pox were very rife, of the confluent and bad Sort, and were worſt in the greateſt Cold: But in Summer, though they were of the confluent Sort, yet they were more mild than in Winter.

In 1716, Summer was hot, with Weſterly Winds: The Small-Pox laſted all Summer, and quite vaniſh'd in Winter, but were more mild.

In 1723, the Summer was dry and cool, with North and Eaſt Winds: The Small-Pox were of the confluent Sort, and bad; ſometimes having the purple Spots; the Sick had nephretic and pleuritic Pains, before the Eruption of the Puſtles.

In 1724, Summer was cold and wet. The Small Pox were of the diſtinct Kind, few and of a good Sort.

In 1726, *May* was hot and dry; *June*, *July*, and Part of *Auguſt* wet, with North Winds. The Small-Pox was moſtly of the confluent Sort, tho' not ſo bad as in 1723.

In 1727, the Winter was very cold, but in *March* the Weather was warmer; and then the Small-Pox appear'd again;

and the Symptoms were worſe as the Weather grew warmer.

In 1729, *September* was moiſt and wet, with a South Wind; which State laſted to *December* in this Seaſon; here and there the Small-Pox appear'd, but were the moſt kind Sort he ever ſaw.

The latter End of Winter was pleaſant, ſerene Weather; the Small-Pox was rife, but as yet of a good Sort; which vaniſh'd gradually at the Approach of Spring.

In 1730, the latter Part of Autumn and Beginning of Winter were wet and rainy: The Small-Pox was then more frequent. In *November* the Froſt came, with Snow and North Winds. The Small-Pox continu'd, which, tho' of a good Sort, yet were not ſo good as in the laſt more mild Seaſon. All *January* was froſty, with a great Quantity of Snow: They who had the Small-Pox had a worſe Sort, and with ſeverer Symptoms.

We muſt obſerve pretty much the ſame in the Meaſles: For we find that in 1721, the Weather was moiſt, cold and rainy, with North Winds: The Meaſles begun in *April*, and laſted all Summer, were of a bad Sort, with continual Coughs, a Difficulty in Breathing, join'd with an Inflammation of the Lungs.

In 1725, the Seaſon was cold and rainy from *April* to the Middle of *December*: About the End of *September* the Meaſles appear'd, but of a good Sort; they continu'd all Winter. *January* was cold and froſty, with ſome Snow; in *February* fell cold Rains, and Snow, with Froſt alternately; the Winds were ſoutherly. About the End of *February*, when the Air grew warmer; they who had the Meaſles, complain'd of a greater Difficulty of Breathing, and had a more obſtinate Cough, ſometimes with pleuritic Pains and a Looſeneſs.

In 1730, in the Beginning of Winter the Weather was wet and moiſt, which

State continu'd almoſt to the End of *November*; to this ſucceeded a ſharp Froſt, with Snow and North Winds. The Meaſles continu'd, tho' of no bad Sort, yet were not ſo mild as in the laſt more mild Seaſon.

May we not hence conclude, that all theſe epidemical Diſtempers chiefly proceeded from, and were influenc'd by the manifeſt Qualities of the Air, contrary to *Sydenham*'s (*g*), but agreeable to *Hippocrates*'s Opinion (*h*)? I could bring many more Proofs, but I believe the Reader will think theſe ſufficient; therefore I will not ſpend any more of his Time, but ſhall proceed to draw a few Aphoriſms from this Chapter.

(*g*) De morb. acut. § 1. cap. 2. pag. 4. and 5. Schedul. monit. pag. 486.

(*h*) Epid. Lib. 1. § 3. & ubique de Humorib. pag. 50. de Natur. Homin. 227.

APHORISMS

Deduc'd from the

Obſervations made in this Chapter.

APH. I.

FROSTY Weather is bad for phthiſical and conſumptive People, bringing pleuritic Pains: It cauſes inflammatory Diſtempers, ſuch as Pleuriſies, Peripneumonies, Quinſies, Rheumatiſms, with acute Pains, and a ſtrong Pulſe: It increaſes pleuritic Pains in the Paroxyſms of Agues; brings a Difficulty of Breathing in old pituitous People; and weakly People have Diarrhæas, Stranguries, aſthmatic, hyſteric, and hypochondriac Symptoms. The Small-Pox in this Weather is commonly of the confluent Sort, with ſome bad Symptoms, as appears from § 3, 4, 5, 13, 14, 15, 16 and 18.

APH. II.

In cold and moiſt Autumns, Diarrhæas, and Dyſenteries, with a ſlow Fever; as appears from § 5.

APH. III.

A Change to a cold and moiſt State in Summer, brings Diarrhæeas, Dyſenteries, Gripings, *&c.* and People in Fevers are ſubject to have Diarrhæas, and then the Criſis often goes off this Way; as appears from § 7. They are alſo ſubject to Cholera Morbus, and other Diſeaſes which afflict the Stomach and Bowels, as is evident from § 14.

APH. IV.

In moiſt, cold, rainy Summers, People are ſubject to Intermittents, as appears from § 10. Such a Seaſon is commonly very healthy, except a few Days at firſt; as appears from § 12. § 13. and § 18. And in whatever Diſtempers any labour'd, they complain'd of a Vertigo, a Coma, Torpor, Drowſineſs (*i*), Stupor, a Heavineſs in the Head, and Dulneſs of Hearing; and they who labour'd under any hypochondriac and melancholic Diſorder, not only were ſenſible of the daily Moiſture, but the Symptoms were much increaſed the following Spring, as appears from § 9, 13, and 15.

APH. V.

In a cold and wet *May*, the Sick in Intermittents and Remittents were more frequently afflicted with pleuritic Pains in this, than in the hot Weather; as appears from § 15.

APH. VI.

From *September* to *December* was wet and rainy Weather; Intermittents were ſtirring, as appears from § 15. With this Weather were South Winds; then hyſteric and hypochondriac People were very bad; many of 'em labour'd under Vomitings, and flatulent and diſtending Pains in the Stomach

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(*i*) *Hippocrates*, Aph. 16. § 3. "In wet Seaſons are "generally long Fevers, Looſeneſſes, Corruptions, Epi"lepſies, Apoplexies and Quinſies."

Stomach and Bowels; the Sick of whatever Diſeaſe, had always a perpetual Cough, a Pain and Weight in the Head, Stupor and Drowſineſs; and even ſome, who ſeem'd otherwiſe well, were affected in the Head; as appears from § 18.

APH. VII.

In *September* fell large Rains with South Winds; then came Cholera Morbus, Dyſenteries, Diarrhæas, &c. as is evident from § 19.

APH. VIII.

Small Pox are commonly diſtinct, and of a good, kind Sort, in moderate, warm, and moiſt Seaſons; and *vice verſa*, as appears from § 3, 4, 10, 11, 13, 14, 16, and 17.

APH. IX.

In a hot and dry Summer Remittents and ſome Intermittents were ſtirring; eſpecially the former, which at the Beginning reſembl'd the σύνοχος, as appears from § 5. Putrid Fevers, call'd σύνοχοι, appear'd:

Remittents remain'd, but with worſe Symptoms, and more irregular Paroxyſms, than in the Year before, as is evident from § 6. and in ſome People large ſpontaneous Hæmorrhages (*k*), Spittings and Vomitings of Blood, as appears from § 7.

APH. X.

In this dry, though not hot Seaſon, Remittents and Intermittents were rife; they who labour'd in Fevers and Intermittents, were delirious in the Paroxyſms, as appears from § 8, 14, 16. This Symptom ſeems to attend a warm, dry Seaſon, as a Dulneſs of Hearing, Stupor, *&c.* do a moiſt Seaſon.

APH. XI.

In cool, dry Summers, inflammatory Diſtempers are moſt frequent, and more ſevere than in any other, as appears from § 11.

APH.

(*k*) Is it not apparent hence, why *Hippocrates* ſo often mentions People bleeding at the Noſe in Fevers more frequent than here with us?

APH. XII.

A cool Air in *July*, with North Winds and ſome Rain, brought Pleuriſies and Quinſies, as appears from § 16.

APH. XIII.

In a cold *September*, with North Winds, the Paroxyſms of Intermittents were attended with greater Coldneſs, with pleuritic and rheumatic Pains, but they went off with the Fever, as appears from § 16.

APH. XIV.

In a cold and dry *February* and *March*, were Pleuriſies, Peripneumonies, Quinſies, rheumatic, podagric and arthritic Pains, convulſive Coughs, from a ſharp Serum vellicating the Larynx, and other ſuch like inflammatory Indiſpoſitions, with a hard Pulſe, as appears from § 14.

APH. XV.

Chin-Coughs were innumerable, Quinſies, Peripneumonies, Pleuriſies, Rheumatiſms, Cephalalgias, Ophthalmies, Eryſipelatodes,

pelatodes, Itchings, and cutaneous Eruptions were very riſe, as appears from § 17.

APH. XVI.

In a warm *April*, with a Weſt Wind, inflammatory Diſtempers were leſs frequent, as appears from § 18.

APH. XVII.

A Change to a cold State in *May*, brought Gripings, Diarrhæas, and ſome Iliac Paſſions, *&c.* as appears from § 18.

APH. XVIII.

In a warm latter End of *May*, Intermittents often ended in a Jaundice, as appears from § 18.

APH. XIX.

Inflammatory Diſtempers are often worſe at the Beginning of a Thaw, as appears from § 2, 3, 16.

APH. XX.

Cutaneous Eruptions often attend a moiſt, wet Seaſon, as appears from § 15.

CHAP. III.

On DIET.

Diet neceſſary to be conſider'd in a Medicinal Way.

§ I. DIET has been eſteem'd by the moſt eminent among the ancient Phyſicians, ever ſince the Time of *Hippocrates* (who was the firſt that us'd it in a medicinal Way) (*a*) as one of the principal Points to be obſerv'd in the Cure of Chronic Diſtempers. It is from Errors committed in this Part of Non-naturals, that the chief of Chronic Diſeaſes ſpring: It wou'd be endleſs to produce Authorities to ſhew this, it being what makes ſo great a Part of the Works of all the ſtandard Writers in Phyſic: How ſo uſeful and neceſſary a Part of Cure

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(*a*) Le Clerc Hiſtoir. de la Medic.

Cure came to be ſo much neglected, is not my Buſineſs to ſhow in this Place.

Simplicity of Diet among the Ancients.

The preſent luxurious Way of Living daily produces Diſtempers unknown to the Ancients; for they not only prolong'd their Lives, but enjoy'd 'em; whereas too many, now-a-days, chooſe to load their Conſtitutions with ſuch various Cauſes of Cachexies, and divers Diſtempers, as even render Life it ſelf an inſupportable Burden, rather than deny themſelves the Gratification of indulging their Appetites. It will not, I hope, be thought an uſeleſs Speculation, to look back into the Manner of Living amongſt the Ancients, which will convince Mankind, that People may be ſtrong and healthy, without feeding as luxuriouſly as we do in this Age.

§ 2. In the moſt early Times, Men liv'd upon ſuch Fruits as ſprung out of the Earth, without Art or Cultivation; and deſir'd no Sort of Drink, beſides that which the Rivers and Fountains afforded:

Thus *Lucretius* (*b*) has deſcrib'd the Food then us'd——

Quæ Sol atque imbres dederant, quod
terra crearet
Sponte ſua, ſatis id placabat pectora
donum.

We have an Inſtance of Perſons living even upon Graſs and Hay (*c*): *Ælian* (*d*) deſcribing the moſt ancient Food of ſeveral Nations, reports, that at *Argos*, they chiefly liv'd upon Pears; at *Athens* upon Figs; in *Arcadia* upon Acorns; hence the *Arcadians* in *Lycophron*, are call'd ϐαλανηφάγοι, *Acorn-Eaters*; and at *Rome* (*e*) alſo the *Corona civica*, by *Virgil* call'd (*f*) *Quercus Civilis*, was compos'd, " *Fronde Querna, quoniam ci-* " *bus, victuſque antiquiſſimus, Quernus* " *capi ſolitus.*" Upon theſe Things they liv'd,

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(*b*) Lib. 5. *Potter*'s Antiq. Vol. 2. pag. 357. and Herod. 1. 17. 1. 20. 4. 177. 185.

(*c*) Tulp. Obſerv. Lib. 4. Cap. 10. and *Nebuchadnezzar* liv'd upon Graſs ſeven Years; *Daniel*, Chap. 4. Verſe 32, 33.

(*d*) Var. Hiſtor. Lib. 3. Cap. 39.

(*e*) A. Gellius, Lib. 5. Cap. 6. *Kennet*'s Antiq. Lib. 4. Cap. 16. pag. 221.

(*f*) Æn. 6. Ver. 772.

liv'd, 'till they begun to till the Ground, and grow Corn: That Sort which was firſt in Uſe was Barley, as *Artemidorus* tells us (*g*); hence *Pliny* (*h*) ſays, Some Gladiators were call'd *Hordearii*, from the *Latin* Name of Barley. But as better Grains came in Uſe, this was neglected, and only us'd as a Puniſhment amongſt the Soldiers, as we find in the *Roman* Camp, who were to eat this, inſtead of Bread Corn (*i*); an Example of which we find in the ſecond *Punic* War, wherein the Cohorts which loſt their Standards, had an Allowance of Barley aſſign'd them by *Marcellus* (*k*); and *Auguſtus Cæſar* did the ſame, as *Suetonius* reports (*l*).

The firſt Ages of Men, *Plato* ſays (*m*), wholly abſtain'd from Fleſh, out of an Opinion that it was unlawful to eat or pollute

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(*g*) Lib. 1. Cap. 71.

(*h*) Nat. Hiſt. Lib. 18. Cap. 7.

(*i*) Vegetius de re militari, Lib. 1. Cap. 13.

(*k*) Plutarch. vit. Marcell. pag. 408. Livy, Lib. 27.

(*l*) Vita Auguſt. Cæſar. Cap. 24. pag. 66. viz. Si quæ ceſſiſſent loco decimatas hordeo pavit, Centuriones, ſtatione deſerta itidem, ut manipulares, capitali animadverſione puniit. *Kennet*'s Rom. Antiq. Part 2. Chap. 15. p. 220.

(*m*) Lib. 6 de Legibus.

pollute the Altars of the Gods with the Blood of living Creatures: However, after ſome Time, they began to eat Fleſh; and that of Swine was the firſt of all Animals, they being wholly unſerviceable to all other Purpoſes; but Oxen for ſeveral Ages were not eaten, it being thought unlawful, becauſe they were ſerviceable to Mankind in cultivating the Ground.

The Ancients then did not ſeek for Rarities or Dainties; but were content with Sheep, Goats, Swine, and Oxen, when it was become lawful to kill them; with what they caught in Hunting, with what was moſt eaſily provided, and afforded the moſt healthful Nouriſhment. Thus all the *Grecians* mention'd by *Homer* liv'd upon a ſimple Diet, young and old, Kings and private Men were content with the ſame Proviſions; neither boil'd, nor with Sauce; but only roaſted (*n*). They did eat no other than groſs

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(*n*) Athenæus, Lib. 1. pag. 9.

Food (*o*); *Servius* (*p*) obſerves out of *Varro*, that among the *Romans* the primitive Diet was roaſt Meat, then boil'd; and laſt of all Broths came into Uſe.

This was the Way of living among the ancient *Greeks*; neither were the *Lacedæmonians* of later Ages, leſs temperate than their Anceſtors, ſo long as they obſerv'd the Laws of *Lycurgus*; who (to prevent Luxury) appointed publick Meals (*q*): Much the ſame was obſerv'd formerly in *Perſia*, and alſo in *Cyrus*'s Reign (*r*); for, by Authority, the Children were not left to the Management of their Parents, but were regulated upon Principles, for publick Good.

The *Indian* Brachmans (*s*) had a Strain beyond all the Wit of *Greece*, beginning their

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(*o*) Rollin. Belles Lettr. pag. 379. Vol. 1.

(*p*) In Ænead. 1.

(*q*) *Rollin.* Ancient Hiſt. Vol. 2. pag. 322, 325, Bell. Lettr. Vol. 3. pag. 297. Plutarch. vit. Lycurg. Vol. 1. pag. 136.

(*r*) *Rollin.* Ant. Hiſt. Vol. 2. pag. 280. Bell. Lettr. Vol. 3. pag. 299.

(*s*) *Kennet*'s Antiq. pag. 15. Eſſay 2. Sir *William Temple*'s Miſcell. pag. 2. Eſſay 1.

their Care of Mankind, even before their Birth; and employing much Thought and Diligence, about the Diet and Entertainment of their Breeding Women; ſo far as to furniſh 'em with pleaſant Imaginations, to compoſe their Minds and their Sleep with the beſt Temper, during the Time that they carried their Burthen.

We read alſo in *Zenophon*'s *Cyropædia*, Lib. 1. pag. 3, —— 8, that the only Food allow'd either the Children or the young Men in *Perſia*, was Bread, Creſſes, and Water. And in the Dialogue betwixt *Cyrus* and his Grand-father *Aſtyages*, the firſt told the latter, who was entertaining him very ſumptuouſly, That the *Perſians* eat nothing but Bread and Creſſes, which would anſwer the ſame Purpoſe. *Rollin*. Anc. Hiſt. Vol. 2. pag. 82.

The Cooks of *Lacedæmon* were only Dreſſers of Fleſh, and they who undertook any Thing farther in the Art of Cookery, were caſt out of *Sparta*, as the Filth of Men infected with the Plague (*t*):

(*t*) Ælian, Lib. 14, Cap. 7.

Wherefore *Mithæcus* a *Sicilian* (u), a very eminent Cook, deſigning to follow his Profeſſion in that City, was immediately order'd by the Magiſtrates to depart: But in other Cities in *Greece*, and in latter Ages, the Art of Cookery was in greater Eſteem; tho' *Heraclides* and *Glaucus* the *Locreuſian*, who wrote Books concerning it, affirm, That it was unworthy of the meaneſt Perſon, who was free-born, as we are inform'd by *Athenæus* (w); and that the *Sicilian* Cooks were priz'd above any others, as the ſame Author has prov'd out of *Cratinus* and *Antiphanes*. The *Sicilians* were ſo remarkable for their way of Living, that a *Sicilian* Table, was a proverbial Phraſe for one furniſh'd very profuſely and luxuriouſly; as was *Daphnicis moribus vivere*, to expreſs the moſt diſſolute and luxurious Way of living (x). Next to the *Lacedæmonian* Tables, thoſe of *Athens* were furniſh'd moſt frugally; hence to live like an *Athenian*, was to live penuriouſly.

(u) Maxim. Tyrius principio Diſſert. 7.

(w) Lib. 14. Cap. 23.

(x) Strabo, Lib. 16. pag. 750. Procopius Perſicorum, Lib. 2.

In *Egypt* the Quantity, as well as Quality, of both Eatables and Liquids, were formerly preſcrib'd by the Laws to the King (*y*), whoſe Table was cover'd with nothing but the moſt common Meat; becauſe Eating was deſign'd, not to tickle the Palate, but to ſatisfy the Cravings of Nature. The ſame Simplicity was ſeen in all other Things; they had ſuch an Averſion to Luxury, that *Plutarch* (*z*) tells us of a Temple in *Thebes*, which had one of its Pillars inſcrib'd with Imprecations againſt that King, who firſt introduc'd Luxury and Profuſion in *Egypt*.

Caſſius (*a*) the *Roman* General (*Anno* 299 before *Chriſt*) on his coming to *Antioch*, by public Proclamation prohibited all his Soldiers from going to the Temple of *Daphne*, that they might not be corrupted by the Luxury and Debauchery of that Place. And when *Publius Scipio*

(*y*) *Rollin*'s Ant. Hiſt. Vol. 1. pag. 33.
(*z*) De Iſid. & Oſir. pag. 354.
(*a*) *Prideaux*. Connect. Vol. 1. Part 1. Lib. 8. pa. 563.

Africanus jun' *Spurius Mummius*, and L. *Metellus* (*b*) went from *Rome*, upon a Commiſſion to *Alexandria* in *Egypt*, they were there entertain'd with Rarities of the moſt ſumptuous Fare; yet they wou'd touch nothing more of it, than what was uſeful in the moſt temperate Manner, for the neceſſary Support of Nature, deſpiſing all the reſt, as that which corrupted the Mind, as well as the Body, and bred vitious Humours in both.

Such was the Moderation and Temperance of the *Romans* at this Time (*c*); and hereby it was that they at length advanc'd their State to ſo great a Height; but when their Proſperity and great Wealth became the Occaſion that they degenerated into Luxury and Corruption of Manners, which brought many Diſeaſes, or ill Habits of the Body, unknown to former and ſimpler Ages; they then drew Decay and Ruin as faſt upon 'em, as they had before Victory and Proſperity, 'till

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(*b*) Diodor. Sicul. Legat. 32. *Prideaux*. Connect. Vol. 2. Lib. 4. Part 2. pag. 295.

(*c*) One hundred and thirty ſix Years before Chriſt.

'till at length they were undone by it, ſo that *Juvenal* (*d*) very juſtly ſays of 'em,

——————— *Sævior armis*
Luxuria incubuit victumque ulciſcitur
orbem.

Luxury, though pleaſant, is attended with very fatal Conſequences, and may be emblematically repreſented, by that ingenious Fable of *Homer*'s (*Odyſ. Lib.* 12. *Lin.* 39. *& deinceps*) where he ſpeaks of the *Syrens*, whoſe ſweet Voices and harmonious Songs, drew all ſuch as had the Curioſity to hear 'em into a Precipice; for which Reaſon *Martial* calls 'em very elegantly, the pleaſing Pain, the cruel Joy, and the agreeable Deſtruction of Mariners:

Sirenas, hilarem navigantium pœnam,
Blandaſque mortes, gaudiumque cru-
dele (*e*).

In what Manner Diet affects our Conſtitutions. 1ſt, By its Quality.

§ 3. Our Food conſiſts, not only of ſuch Particles as are proper for the Nouriſh-

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(*d*) Sat. 6. Verſ. 29.
(*e*) *Rollin.* Bell. Lettr. Vol. 1. pag. 397.

Nouriſhment and Support of the Body, but alſo contains in it certain active Principles, as Salts, Oils, Spirits, *&c.* whoſe Properties are, both by vellicating and ſtimulating the Solids to quicken the Circulation, and by attenuating the Fluids, to render 'em more fit to undergo the neceſſary Secretions. The Art of Life then, is to aſcertain the Mediocrity of ſuch a Diet, as neither makes the Salts and Oils too many to cauſe any Diſtemper; nor too few to let the Solids become too much relax'd: Suppoſe, *ex. gr.* a Dram of Salts, Oils, or Spirits in 24 Hours was neceſſary; then certainly that Diet which conveys this Dram in the whole Subſtance of the Food, will be beſt: But if by an Over-charge of Salts and Oils, Diſeaſes are brought on, and are to be remedied by a Diet, wherein one Half of this Quantity is found, then ſuch Food is to be choſen, or ſuch a Quantity of it taken, as will convey into the Body only half a Dram of ſuch. And if that End can be obtain'd, by following the common, ordinary Diet of the healthieſt People in any Country or

Climate; then that is, beyond Diſpute, the beſt Regimen in general to preſerve Health. For certainly the infinitely wiſe Creator has provided Food proper and peculiar to each Climate and Country; which is the beſt for the Support of the Creatures he has plac'd there, as we ſee by the Health and Chearfulneſs of the middling Sort of People of almoſt all Nations; who only uſe ſimple Diet, without luſting after foreign Delicacies. Under Diſeaſes indeed the Caſe is different, for then the Sick often require Subſtances of more active Principles, than what are found in common Diet, in order to produce ſudden Alterations; but where ſuch Alterations are not neceſſary, the ſame Effect may be obtain'd by the repeated Force of Diet, with more Safety to the Body, where leſs ſudden Changes are leſs dangerous (*f*). The ſmaller Activity of Aliment is compenſated by it's Quantity; for, according to the Laws of Motion, if the Bulk and Activity of Aliment and Medicine, are in reciprocal Propor-

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(*f*) Celſus. Præfat. ad Lib. 5. pag. 241.

Proportion, the Effect will be the ſame; for they both only bring about the Effect, by acting either upon the Solids or Fluids; upon the firſt, by ſtimulating, contracting, or relaxing; upon the laſt, by attenuating, coagulating, or rendering them acrimonious, or more mild. That all theſe can be perform'd by Diet, as well as Medicine, is evident from Reaſon, Experience, and, in ſome Caſes, from ocular Demonſtration, as in Chirurgery, in Wounds and Sores, where we may ſee the Influence upon them by Diet; for a too relaxing Diet begets what they call proud Fleſh; and when too aſtringent, a Cicatrice; hence we ſee the Quality of Diet (though much neglected) yet comes under the Notice of a Phyſician, as well as that of Medicine: The only Difficulty then will be, in chooſing which Kind, and what Quantity of Food, beſt ſuits the Patient.

By its Quantity.

§ 4. Too great a Quantity of Food in the Stomach, ſtretches the Fibres, and compreſſes the Veſſels; whence, as there is leſs Blood in the Veſſels of a full, than empty Stomach (*g*); it muſt not only be cooler, by Reaſon of a more retarded Motion of the Blood, (which we find in ſome Degree after ordinary Meals) but muſt alſo have much leſs Moiſture ſeparated from its Glands, at a Time, when the too great Maſs of Food requires an extraordinary Supply of Moiſture; the Conſequence of which, muſt be a more difficult and unkindly Digeſtion. Moreover the Action of the Stomach is totally ſtop'd by too great Repletion; in which Caſe both the Orifices of the Stomach by a neceſſary Mechaniſm cloſe, and neither will admit nor expel any Thing; conſequently relaxing, as by warm Water, is the only proper Expedient. Hence Crudities, Ructus, Nauſeas, *&c.* Whence Obſtructions in the Glands of the Meſentery, Lungs, Liver, Spleen, *&c.* The Stomach, by preſſing the Diaphragm too much upwards, leſſens the Cavity of the Thorax: Hence Diſpnæas, and a viſcid State of the Blood; by compreſſing the Aorta (eſpecially if in Bed, lying on the Back,

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(*g*) *Hales*'s Hæmaſt. pag. 182. Exp. 23. Sect. 7.

Back, and forcing the Blood more upwards) it cauſes Apoplexies, *&c.*

If we eat too little, the Fibres will grow weak for want of Nouriſhment, whence thoſe Evils mention'd under a weak and lax Fibre will enſue; and the Blood, by a conſtant Attrition, will become ſharp, acrid, and of an Alcaline Nature; from whence we may very juſtly conclude, that feeding too ſparingly, is of worſe Conſequence than living too generouſly, as *Sanctorius* and *Hippocrates* obſerve (*b*); for the laſt Author ſays, "the Damage of a more full Diet, is ſoon "remedied by Exerciſe or gentle Evacuants; but the Decay of Strength, "(the natural Conſequence of too ſpare "Diet) is not ſo eaſily repair'd." When the Stomach is too full or too empty, the Excretion of Perſpiration is ſtop'd, as *Sanctorius* tells us (*i*).

We obſerv'd above, that the Veſſels of the Stomach when full, contain'd a leſs Quantity

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(*b*) *Hippoc.* Aph. 5. § 1. pag. 1243. *Sanctor.* Aph. 15, 16, 32, 33, and 40. § 3.

(*i*) Aph. 11. § 3. pag. 172.

Quantity of Blood; ſo when empty, there being a greater Flow of Blood, muſt occaſion a greater Heat (*k*); which, I doubt not, contributes to encreaſe Appetite and Digeſtion; which is ſtill more confirm'd; for that, in Winter, when the external Veſſels are contracted by the cold Air, and the Blood thereby flowing more in the inner Veſſels, the Digeſtion and Appetite are ſtrongeſt, there then being a more plentiful Secretion from the Glands of the Stomach.

Long Abſtinence from Food may be the Parent of many Diſeaſes, eſpecially in hot, bilious Conſtitutions; and alſo very painful to acid Conſtitutions, from the uneaſy Senſation it makes in the Stomach. A Lady, who had been very much afflicted with ſome of theſe Pains; after taking great Quantities of Abſorbents, and Stomachics, which had been preſcrib'd her by ſeveral Phyſicians; and after ſhe had try'd the *Bath* Waters, return'd Home without any Signs of Recovery,

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(*k*) *Hale*'s Hæmaſt. pag. 182. Exp. 23. § 8.

covery, and ſent for me; I deſir'd her to continue taking the ſame Electuary, which was order'd before I was conſulted (it was compos'd of the aromatic, warm Stomachics) and to divide her Meals, ſo as to take ſome every third Hour; which Method ſhe continu'd for ſome Time together, and was thereby reſtor'd to her perfect Health.

There can be no certain Quantity laid down, for all Conſtitutions, nay not even for one and the ſame Perſon, at different Times; for, as *Hippocrates* ſays, *Ut Labor, ſic Cibus:* The beſt and general Rule is, not to eat longer, than the Diſtention of the Stomach is eaſy and free; nay, even to riſe from Table with an Appetite; our Appetite is therefore, the beſt (tho' not infallible) Guide, both in Sickneſs and Health *(l)*. Hence may be ſeen the Folly of By-ſtanders and Nurſes, who are continually cramming the Sick, when Nature craves not; and daily Experience con-

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(*l*) Keil. Med. Stat. Brit. Aph. 47. pag. 338.

confirms that Obſervation of *Hippocrates* (*m*): "That the more we nouriſh "impure Bodies, the more Damage they "receive;" for nothing is more certain, than by how much the more is taken in, than is ſufficient for the Exigencies of Nature; by ſo much the ſooner will the Body be wore out; becauſe by ſuch Means, all the ſecretory Organs are more and faſter wore away, than is needful; and the Elaſticity of all the Solids ſooner decays. Is it not abſurd, ſays Dr. *Keil* (*n*), for one who has half his Perſpiration ſtop'd in a Day, to eat as much as if all had been evacuated?

Many People eat of a great Variety of Food at the ſame Meal, which is very unwholeſome: *Celſus*'s Rule is the beſt, for he ſays, *Plurima in dando cibo diſcrimina reperiuntur: ex quibus contentus uno ero. Præfat. pag.* 19. *lin.* 19.

From what has been ſaid may be deduc'd the Reaſon, why *Hippocrates* (*o*) ſays,

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(*m*) Aph. 10. § 2. pag. 1244.
(*n*) Med. Stat. Brit. Aph. 47.
(*o*) Aph. 13. § 1. pag. 1243.

ſays, "Old Men require leſs Meat than "young:" Why, "When *(p)* Diſtempers are at the Height, the Diet ought "to be the moſt ſlender;" as alſo *(q)* "Why it ought to be ſo in the Paroxyſms of Diſeaſes."

People whoſe Digeſtion is impair'd, ought to eat but little at a Time, and often; for 'tis certain, the Force of the Stomach upon a little, is greater than it is upon a larger Quantity of Food; therefore a great Quantity is more difficultly digeſted.

The Importante of a proper Diet.

§ 5. The Choice of Diet is of the utmoſt Importance to ſuch as have weak Lungs; for the Chyle in the Thoracic Duct, retains ſomething of the original Taſte and Flavour of the Aliment *(r)*, which not being yet converted to Blood, muſt operate, and have ſome Effect upon the Lungs, into which it enters in this Condition, according to its original Qualities.

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(p) Ibid. Aph. 11. Sect. 1. pag. 1242.
(q) Ibid. Aph. 11. § 1.
(r) Boerhaav. Chem. Vol. 1. pag. 65.

In an alcaline Diſpoſition of the Blood and Juices, when the Urine appears red, ſmells ill, and taſtes alcalious; Vegetable Acids are the proper Diet, and animal Food prejudicial.

On the contrary, if the Humours are aceſcent or acid (as frequently happens in Infants, convuls'd from a Coagulation of the Milk in their Stomachs) Broth made of the Fleſh of Animals, Eggs, or the like, are proper; whilſt vegetable Acids wou'd prove hurtful: Hence appears more particularly, the Inconveniencies ariſing from an Exceſs in any one Sort of Diet; for if it be ever ſo innocent, a long Continuance of it without any Alteration, may diſpoſe the Humours to tend towards an acid or alcaline Diſpoſition; ſo that our modern Diſhes, which are ſo well and ſo conſtantly fraught with Salt and Spices, muſt be very prejudicial, eſpecially to thoſe of an indolent, lazy, and ſedentary Life.

Nature has provided a great Variety of Nouriſhment for Human Creatures, and furniſh'd us with Appetites to deſire, and Organs to digeſt them. As Aliments have different Qualities; a conſtant Adherence to one Sort, may make the Conſtitution verge to ſome one Extreme or other; therefore *Celſus*'s Rule 1. Chap. 1. is a good one, *Sanus homo qui bene valet & ſuæ ſpontis eſt, nullis obligare ſe legibus debet, nullum cibi genus fugere quo populus utitur, interdum in convivio eſſe, interdum ab eo ſe abſtinere, modo plus, modo amplius aſſumere, &c.* An unerring Regularity is almoſt impracticable, and the Swerving from it, when it is grown habitual, dangerous; for every Thing in a human Body becomes a Stimulus, as Wine or Fleſh Meat to one not us'd to 'em: in diſeas'd Perſons, as in too ſtrict, or too lax a State of the Fibres; in too acid or bilous State of Humours; a conſtant Adherence to one Sort of Diet may carry the Caſe beyond a Cure to the contrary Extreme.

The Strength of the Aliment, (by which I underſtand its Reſiſtance to the ſolid Parts) ought to be proportion'd to the Strength of the ſolid Parts; and as Perſons who uſe a great deal of Labour or Exerciſe, have their ſolid Parts more elaſtic and ſtrong, they can bear, and ought to have ſtronger Food, too thin Nouriſhment being quickly diſſipated, by the vigorous Action of their Solids: For it is equally abſurd, for a ſtrong, hale Man to feed upon too ſpare and thin Diet, as for one whoſe Digeſtion is impair'd to the very loweſt State, to feed upon nothing but Beef and Bacon. Hence we ſee, that what is wholeſome for one, is unwholeſome for another, they being only relative Terms, and are ſo, according to the Diverſity of the Conſtitutions; either as to their different Degrees of Strength and Tention of the Fibres, in ſome being too weak and lax, in others too ſtrong and elaſtic; or according to the different State of their Fluids, which, as they conſiſt of Spirit, Water, Oil, Salts, and terreſtrial Parts, ſo they differ according to the Redundance of the whole, or any Part of theſe Ingredients. Health conſiſts in the Æquilibrium between the Solids and Fluids; for when the Fluids don't preſs upon the Solids with a greater Force than they can bear, and no more in one Part than another; and on the other Hand, when the Solids reſiſt and act upon the Fluids ſo equally, that there is no uneaſy Senſation, the Perſon is then in perfect Health; whatever therefore is in our Food, that deſtroys this Æquilibrium, either by too much relaxing or contracting the Solids; or by either attenuating or rendering the Fluids too viſcid or acrimonious, muſt have the Effects mention'd under each of thoſe Heads.

Our Food, as to it's Quality, is either from the animal or vegetable Kingdom; 'tis either more or leſs nouriſhing; either ſolid or fluid; ſimple or more compounded. That taken from animal Bodies, ſeems beſt qualify'd for the recruiting of diminiſh'd Strength, and repairing the Loſs our Fibres ſuſtain in daily Motion;

tion; conſiſting of Parts, which have heretofore been digeſted by the proper Organs of the Animal, and applied to the ſame Uſe. Whereas vegetable Food muſt be converted into Nouriſhment, by the proper Action of our own Viſcera or Lungs; And whatſoever Food is neareſt allied to the Animal Juices nouriſhes moſt; now nothing does this more than Fleſh-Meat, Jellies, Broths, *&c.* And we find all Animals that live on Fleſh-Meat, eat leſs, and are ſtronger than others. On the other Hand, vegetable Food requires more Labour of the Stomach and other Viſcera to reduce it to be fit for Nouriſhment.

Proper Diet for a rigid, and too lax State of the Fibres.

§ 6. Things of our Food that relax the Fibres, are warm Water, Tea, Whey, watery Decoctions of farinaceous Vegetables or Grains, as Peas, Beans, *&c.* all ſweet and mild Garden Fruits, as Cherries, Strawberries and Melons, Cucumbers, and ſuch as may be boil'd into a Jelly, Spinage, Cole, Beets, Cabbage, Coleworts, and all that Tribe; Lacteſcent Plants, ſuch as Lettuce, Succory and Dandelion if unfermented; Carrots, Parſnips, Skirrets, Scorzonera, and Goat's-beard; Oils from mild Plants, or Nuts, Cream, Butter, Marrow, and Whey for Drink; all theſe Things help to weaken the Fibres, and are therefore Remedies for a too rigid, ſtrong, or elaſtic State. The Signs of a rigid State of Fibres are a hard, dry, ſcraggy, hairy, warm Body, with firm and rigid Muſcles, a ſtrong Pulſe, Activity and Promptneſs in animal Actions. They whoſe Fibres are weak, ought to uſe that Sort of Food, which requires but a ſmall Force to convert it into animal Subſtances; ſuch as Milk, Broths, Jellies made of the muſcular Parts of Animals clear'd from Fat, and warm Eggs from the Hen; for *Boerhaave* obſerv'd *, that they by keeping and boiling were both harder to digeſt, and loſt the moſt ſpirituous Parts; they are the moſt nouriſhing of all animal Food; light Bread Puddings, *&c.* taken in ſmall Quantities, and often; a little red Wine and Water, *&c.* all Kinds of Sorrel, Quinces, ſome Sorts of Pears, Plumbs, Medlars, Capers, Barberries, Pomegranates, Purſlain, and ſuch like gentle

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* *Chem. Vol.* 2. *Proceſs* 100. *pag.* 340.

Aſtringents; as alſo the hot Salads and Roots. The Signs of a lax State of Fibres are Paleneſs, a weak Pulſe, Palpitations of the Heart, ſlack and flabby Muſcles, Lazineſs, being ſoon tir'd, Bloatedneſs, and ſcorbutic Spots, being ſubject to œdematous Swellings, Crudities, *&c.* Hence we ſee, what cauſes one of theſe States of the Fibres, is a Remedy for the other, and ſo *vice verſa.*

Proper Diet for an acid Acrimony.

§ 7. *Firſt*, They who abound with the acid Acrimony, can't be cur'd with anti-acid Medicines, unleſs their Diet be of the ſame Kind; all animal Subſtances, are Food of the anti-acid Kind, which are all alcaleſcent; eſpecially ſuch as feed upon Animals; more particularly Shell-Fiſh, and thoſe of the idle Sort, as Eels, which, for want of Exerciſe, are fat and ſlimy; hence Fiſh without Fins and Scales were forbid the *Iſraelites*, *Levit. Chap.* 11. *Ver.* 10. becauſe they were more ſubject to putrefy in that hot Country than the other more firm Sort of Fiſh. For the ſame Reaſon all carnivorous Fowls were forbid. *Ibid.* from Verſe 13. to 20, in the ſame Chapter. The Vegetables of this Tribe are all warm Anti-ſcorbutics, the hot Salads, and Roots, Celery, Parſley, Aſparagus, Creſſes, Cabbage, Cole, Turnips, Potatoes, Carrots, Rockambole, Onions, Leeks, Garlick, Shalots, Radiſhes, Muſtard, Horſe-Raddiſh, Aſparagus, Eringo Roots, Nettles, and all the warm Spices, Parſnips are more mild, Truffles, Morelles, Muſhrooms, and moſt Kind of Nuts, are all of this Sort. This Diſtemper is moſt incident to Children, becauſe their general Diet, together with their weak Fibres, contribute towards it; and yet it is poſſible to cure 'em, if the Nurſe would live altogether upon Animals, and an alcaleſcent Diet.

The Signs of an acid State, are ſour Belchings, a craving Appetite ſometimes of unuſual Things, as in the Caſe of the Green-Sickneſs, cholical Pains, dry Gripes, a Change in the Colour of the Bile from Yellow towards Green, and a ſour Smell in the Excrements. The chief State of Acidity is in the Primæ Viæ, from whence it ſometimes gets into the Blood, then

Paleneſs of the Skin, Lowneſs of the Pulſe, ſour Saliva, ſome Sort of Eruptions of the Skin, and Itchings are the Signs.

Secondly, They who abound with an alcaline Acrimony, ought to live upon the farinaceous Vegetables; Vinegar, acid Fruits, as Oranges, which is a certain Cure of that Scurvy Sailors are moſt afflicted withal; Lemons, and all mild Anti-ſcorbutics, ſuch as Sorrel, Succory, Lettuce, Apples, moſt of the common Pickles with Vinegar, and Rheniſh Wine and Water, Whey and Butter-Milk. Thoſe Things of the mealy Kind are aceſcent. Whatever cures one of theſe Acrimonies, will cauſe the other.

For an alcaline Acrimony.

The Signs of an alcaline State in the firſt Stage of Digeſtion are, Thirſt, a Want of Appetite, hot, nidorous Belchings, Foulneſs of the Tongue and Palate, with a putrid, bitter Taſte, Nauſea, bilious Vomitings, a Loathing, bilious Looſeneſſes, Stools with a cadaverous Smell, Iliac Pains, and a Senſation of Heat;

when in the Blood, the Urine and Sweat has a putrid, cadaverous Smell; Eruptions of the Skin of a dark, livid, lead-colour and gangrenous, this is commonly call'd the hot Scurvy.

There are Things proper for both Sorts of Acrimony, and theſe are of the demulcent Kind, ſuch as Decoctions of the farinaceous Legumes, native Oils, ſuch as Cream, Butter, and Marrow, eſpecially in that Scurvy where the Bones crackle; as alſo all inſipid, inodorous Vegetables.

From what has been ſaid, we ſee that theſe Acrimonies may be cur'd by Diet; but a viſcid State of the Body requires ſome more active Principles to diſſolve it, but is aſſiſted as to Diet by diluting Subſtances, as watery Liquors, Robs, and Jellies of Garden Fruits diſſolv'd in Water; and by ſaponaceous Things, as Honey, *&c.* by Stimulants, as are all Kinds of Salts, both acid and alcaline; all Subſtances that abound with acrimonious Oils, ſuch as Onions, Garlick, hot mineral Waters, the aromatic Spices, as Mace, Cinnamon, &c. Thyme, Marjoram, Savory, &c. are proper. The Signs of ſuch a State, are Sickneſs of the Stomach, a Senſe of Fulneſs without Eating, a Want of Appetite, Vomiting up indigeſted Meat a long Time after eating, ſwell'd Abdomen, Wind coming upwards, a pale Urine, almoſt without Smell, Paleneſs, &c. This State is caus'd by living upon unripe Fruits, farinaceous Subſtances unfermented, and taken in great Quantities; all Vegetables that make a black or purple Tincture with the Vitriol of Steel, and have a rough, ſtyptic Taſte, have this Quality; hence Green Tea, and all inflamable Spirits are Coagulaters, as are the Juices of all auſtere Vegetables, which coagulate the Spittle, as ſome Sorts of Plumbs, and ſome Pears, Quinces, Pomegranates, Barberries, Medlars, Cornelian Cherries, Purſlain, Burnet, Tamarinds, Capers, Samphire, and almoſt all Pickles, ſome acidulated and chalybeat Waters.

For the Muriatic Acrimony.

Thirdly, As for the Muriatic Scurvy, that is almoſt peculiar to Sailors, and is beſt cur'd by an acid Food, and acid Fruits, eſpecially Oranges, ſour Butter-Milk, and in other Reſpects to be treated the ſame as in the alcaline State.

Proper Diet when the Humours are too thin.

Fourthly, If the Fluids are too thin; farinaceous, unfermented Subſtances, unripe Fruits, and unfermented Jellies of acid, auſtere Vegetables, hot Sallads and Roots, will ſoon alter that State, and thicken the Fluids.

This is occaſion'd by too watery Things and Acids, ſuch as Vinegar (*s*), which is the moſt penetrating Acid that thins the Blood yet known; and alſo by ſaponaceous Things, ſuch as Honey, Robs, and Sapas.

Diet for an Oily Fatneſs in the Stomach.

§ 8. Some People are ſubject to an oily Fatneſs in the Stomach, and in their Blood and Spittle, which for want of Digeſtion will ſwim ſome Hours after eating, on the Top of the Blood, as appears by Venæſection; and if they ſpit into the Fire,

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(*s*) Boerhaav. Chem. Vol. 2. pag. 212, 380.

Fire, it will burn like Oil: This may be cur'd by acid, and by ſtimulating Subſtances, ſuch as Salt-Petre, Cinnamon, Mace, Nutmegs, Cloves, Ginger, Pepper, Thyme, Savory, Marjoram, Roſemary, Mint, Orange and Lemon Peel, Fennel, Chervil, and Sage; Garlick, Onions, Vinegar, *&c.* Saponaceous Things, ſuch as Sugar and Honey, the Juices of pungent and aromatic Plants; as alſo by a Milk Diet.

Of Tea, Coffee, and Chocolate.

§ 9. As Tea, Coffee, and Chocolate, make ſo conſiderable a Part of Diet, eſpecially among the Female Sex, it may not be improper to ſay ſomething of them in particular.

The moſt active Principles of Tea, extracted by Infuſion, are the moſt ſeparable Parts of its Oil or Gum, and it's Salt: It's Salt and Gum are aſtringent, as appears by mixing it with Chalybeats; it is aceſcent, as appears by it's Effects upon Stomachs troubled with Acidity; by it's Aſtringency it helps in a very ſmall Degree, to moderate the relaxing Quality of warm Water; by it's aſtringent and ſtimulating Quality, it affects the Nerves, as well as the warm Water does the Tone of the Stomach, when us'd ſo conſtantly, as is now become the common Practice; Milk helps to ſoften it, and Sugar, as an Alcaleſcent, adds to it's Stimulus; hence we ſee that Tea is only proper for ſome few particular People.

What is extracted from Coffee by Water, is the moſt ſeparable Parts of it's Oil, which often ſwims at the Top of the Decoction; this Oil is volatile, and conſequently affords little Nutriment, producing all the Effects of an Oil and aromatic Acrimony, ſuch as Dryneſs, Heat, Stimulation, Tremors of the Nerves, and Watchfulneſs; hence it is hurtful to all hot, dry, bilious Conſtitutions, and only beneficial to the Phlegmatic, if to any Body.

Chocolate is much the beſt of the three; it's Oil ſeems to be both rich, alimentary and anodyne; this Oil, with it's own Salt and Sugar, makes it ſaponaceous and detergent, by which Quality it often helps Digeſtion, and excites Appetite; and is only proper for ſome Conſtitutions, *viz.* the leaner and ſtronger Sort of phlegmatic People.

Many Perſons argue, that ſuch innocent Liquors (as they are pleas'd to call 'em) as Tea, Coffee and Chocolate, are ſo ſmall in Quantity in Reſpect to our whole Maſs of Blood, that they can't do any Harm, becauſe they themſelves are not immediately ſenſible of their bad Effects; but *gutta cavat lapidem*; are we to aſſert, that the Hand of a Clock does not move? Or, are we to deny that the Budding of Trees increaſes, becauſe we can't diſcern their Motion and Increaſe? But Experience may confirm 'em of their Error, as well as the following Experiments of Mr. *Hales* in his *Hæmaſt.* from pag. 126, to pag. 139. *Exp.* 15, 16, 17, 18. "He took a young Spaniel Dog,
" which weigh'd 21 Pounds, and as ſoon
" as he had bled him to Death, by cutting
" his Jugular Veins, he immediately open'd
" his Thorax and Abdomen; and having
" fix'd a Glaſs Tube, which was 4 X $\frac{1}{2}$

" Feet high, to the deſcending Aorta, he " ſlip'd open his Guts from End to End. " He firſt pour'd in ſeven Pots full of " warm Water, the firſt of which paſs'd " off in fifty-two Seconds, and the re- " maining Six, gradually in leſs Time, " to the laſt, which paſs'd in forty-ſix " Seconds." Here we muſt obſerve how gradually the warm Water relax'd the Veſſels. " He then pour'd in five Pots of " common Brandy, or unrectify'd Spirit " of Malt, the firſt of which was ſixty- " eight Seconds in paſſing, the laſt ſeven- " ty-two Seconds. He then pour'd in " one Pot of warm Water, which was " fifty-four Seconds in paſſing. Hence " we ſee that Brandy contracts the fine " capillary Arteries, and that warm Wa- " ter ſoon relaxes them again, by dilu- " ting and carrying off the ſpirituous " Part of the Brandy, which, as it is " well known, not only contracts the " Coats of the Blood-Veſſels, but alſo " thickens the Blood and Humours; both " which Effects contribute to the ſudden " Heating of the Blood, by much in- " creaſing thereby its Friction in the con-

" tracted Capillary Veſſels; which ſudden Heat is alſo farther increas'd by " the mere Mixture of Brandy with the " Blood, as Dr. *Boerhaave* obſerv'd in " *Chem.* Vol. 1. pag. 366. that on mixing " of cold Water and Spirit of Wine, they " immediately acquir'd eight Degrees of " Heat, ſo as to make the Mercury in " *Farenheit*'s Thermometer riſe from 44 " to 52 Degrees; which Heat ſoon ceas'd, " as does that ſudden glowing Heat " which it gives the Blood.

" When cold Pump-water, which was " 14 Degrees above the freezing Point, " was pour'd on the Guts, and ſome of " it at the ſame Time pour'd through the " Tube, thoſe fine Capillary Veſſels would " on a ſudden be ſo contracted, as that " the fourth Pot of Water was eighty Seconds longer in paſſing thro' than the " like Quantity of warm Water was juſt " before: And the fifth Pot being warm " Water, and the Guts at the ſame Time " being warm'd by Water pour'd on 'em, " it paſs'd in ſeventy-ſeven Seconds ſooner than the former Pot of cold Water

" did." Hence we plainly ſee how greatly Heat and Cold dilate and contract the Veſſels.

" He made a ſtrong Decoction of *Pe-*
" *ruvian* Bark, well filtrated, and having
" prepar'd a Dog as before, he pour'd
" four Pots of warm Water, containing
" 18 Cubic Inches each, the laſt of
" which paſs'd off in ſixty-two Seconds
" of Time. Then he pour'd in 16 Pots
" of equally warm Decoction of Bark,
" the firſt of which paſs'd off in ſeventy-
" two Seconds, and the following ſlower
" and ſlower, in Proportion as the Veſ-
" ſels grew more and more contracted by
" the Styptic Quality of the Decoction,
" ſo that the 16th Pot was 224 Seconds
" in paſſing. He then pour'd in ſucceſ-
" ſively 11 Pots of Water, of the
" ſame Degree of Heat with the De-
" coction; the firſt of which Pots was
" 198 Seconds in paſſing, and the ſuc-
" ceeding ones paſs'd ſooner and ſooner,
" in Proportion as they waſh'd away the
" Decoction, and thereby relax'd the
" Coats of the Capillary Veſſels, 'till

“ the eight Pot, which paſs'd off in 96 Seconds, after which the three following Pots of Water paſs'd off in the ſame Time. He then pour'd in ſucceſſively five Pots of cold Pump-water, which was 14 Degrees above the freezing Point, and whereas the preceeding Pot of warm Water paſs'd in 96 Seconds, the 5th Pot of this cold Water was 136 Seconds in paſſing. He tried alſo in like Manner a ſtrong Decoction of Oak Bark on another Dog, in which the preceeding Pot of warm Water was 38 Seconds in paſſing, but the following ſix Pots of Decoction ſo contracted the Veſſels, that the laſt of 'em was 136 Seconds in paſſing.

“ Having prepar'd a Decoction of 12 Ounces of Chamomel Flowers, boil'd in three Gallons of Water to two, he pour'd in eleven Pots of it Blood-warm through the Arteries, as above, the firſt of which paſs'd off in ninety-ſix Seconds of Time, the laſt in 138 Seconds, which proves ſome Degree of Stypticity in this Decoction. Then

" the laſt of four Pots of ſcalding hot " Water paſs'd in 116 Seconds: After " theſe, ſix Pots of a Decoction of two " Ounces of Cinnamon, in a Gallon of " Water, being pour'd in hot, the Veſſels " gradually contracting, the laſt Pot was " 216 Seconds in paſſing. Hence we ſee " how effectual Cinnamon, by it's great " Stypticity, is in ſtopping too large Diſ" charges into the Cavity of the Guts. " Then he pour'd a Pot of Milk-warm " Water, which paſs'd in 15 Seconds: " Next a Pot of ſcalding hot Decoction " of Chamomel-Flowers was 194 Se" conds in paſſing; which further ſhows " its Stypticity.

" Having prepar'd a Dog, as above, he " pour'd 12 Pots of warm Water thro' " the Veſſels, the firſt of which was 68 " Seconds in paſſing, the following Pots " paſs'd ſucceſſively faſter and faſter to " the four laſt, which all paſs'd off in " 38 Seconds. Then he pour'd in 17 " Pots of equally warm *Piermont* Water, " the firſt of which was 40 Seconds in " paſſing, and the following Pots were in

"Succeſſion longer and longer in paſſing "to the 17th Pot, which was 76 Seconds "in paſſing. He then pour'd in ten Pots "of equally warm Pump-Water, which "gradually relaxing the Capillary Arteries again, each Pot paſs'd off a little "ſooner and ſooner, to the laſt, which "was 64 Seconds in paſſing off.

We ſee in all theſe Experiments, how the Veſſels of the Body are manifeſtly contracted or relax'd, by different Degrees of Warmth, Heat or Cold; or from the different Qualities of the Fluids which paſs through 'em, as to Reſtringency or relaxing: And ſuch Qualities of the Fluids muſt have very conſiderable Effects on the finer Capillary Veſſels, whoſe Coats bear a much greater Proportion to the contain'd ſmall Fluids, than in larger Veſſels. Tho' it is not to be imagin'd, that the Effects are ſo ſudden and great in a live Animal, as in theſe Experiments; becauſe in a live Animal, the ſeveral Fluids which are taken in, are more gradually and in ſmaller Proportion blended with the Blood: But I think, that tho' in a live Animal what we take in is gradually mix'd with the Humours, yet the Contents of the Liquors acting upon the Nerves as a Stimulus (which it can't do in a dead Body) muſt help to contract 'em almoſt near as much as in theſe Experiments.

Thus we ſee that whatever is taken in, either as Food or Phyſic, will have different Effects on our Solids as well as Fluids, according to their different Natures; and as a healthy State conſiſts in a due Equilibrium between the Solids and Fluids, it greatly imports, that it be rightly adapted to the different Conſtitutions, ſo as either to invigorate, contract or relax the Fibres of the Solids; or to change the Qualities or Quantities of the Fluids, as Occaſion ſhall require.

The moſt proper Times of Eating.

§ 10. The Times of eating ought to be ſuch, that the former Food may be digeſted before more be eaten; and it ſhould be alſo at ſuch a Diſtance from Bed-time, that Digeſtion be nearly finiſh'd before we ſleep; for the Preparation of our Food by the Viſcera, and the Application of it to nouriſh the Body, are Actions ſo very different, that they are inconſiſtent one with another: For Digeſtion is perform'd by Contraction, but Nutrition, by Relaxation; ſo that the Food ſhould be digeſted, before the Fibres be relax'd, in order to nouriſh: Beſides, ſleeping immediately after Eating, as it makes a more viſcid Chyle, ſo does it derive more of it than ordinary into the Maſs of Blood, thro' the enlarg'd Orifices of the Lacteals, and conſequently produces all the ill Effects, that we may expect from a viſcid State of the Humours. Some People will eat only once a Day, but it is wrong, for by that Means they load the digeſtive Powers too much; and, upon all Accounts, a more viſcid Chyle will be carry'd into the Blood, which generally requires more Labour to make it fluid, and fit for Nouriſhment, than the Solids are able to bear: Moreover, a great Quantity of Chyle being pour'd into the Maſs of Blood at once, muſt needs make a great Alteration in the Blood, and put the Inſtruments of Sanguification too much upon the Stretch; which is yet worſe when the Lungs are any way tainted.

The moſt ſeaſonable Time of Eating, in general, is from betwixt an Hour or two after Riſing, and at leaſt four before going to Bed; becauſe the Body, upon Waking, being in a more contracted State, if there be any Remains of the laſt Meal, either undigeſted in the Stomach, or not ſufficiently attenuated in the Veſſels, will (if not prevented by Eating and Drinking) digeſt the remaining Food, attenuate that which is too viſcid, and expel that which is fit. Different Conſtitutions make ſome Alterations in this Reſpect.

Diet preferable to Medicine.

§ 11. Medicines act immediately and invigorate the Blood, but it muſt be Diet that ſtrengthens the Solids; the firſt, as they act quickly, ſo their Effect is ſoon over; but a conſtant, regular Diet, is perpetually adding new Vigour to the Nerves, which are not immediately acted upon by the Sanguineous Fluids; for tho'

tho' you invigorate the Blood by ever ſo generous Medicines, by a Dram or Glaſs of Wine, and ſo raiſe Nature to a great Pitch for a Time, yet the Nerves remain effete and languid notwithſtanding: But if the Nerves and Solids are ſtrengthen'd, as they may be, by a proper Diet, then the Blood and Fluids ſoon reap the Benefit, and as ſoon diſcover it by their Heat and Motion. Theſe are Notices which don't lye ſo far out of the Reach of any Man, who will give himſelf Leave to reflect; for there are Diſtempers, (and theſe not a few or rare) in the Cure of which, no Phyſic alone can take much Effect; nothing but a continual Subtraction of the Cauſe being neceſſary, which we find Medicine alone can't bring about; as we may be convinc'd of, by the foregoing Experiments of Mr. *Hales*.

Some Phyſicians will only judge of this, or that Kind of Food, from what they find by analyſing it, but that Method is very fallacious; which is the Reaſon, why I have not enter'd into a long Detail of the different component

Parts of all Kinds of Food, whether Animal or Vegetable; but only mention this general Rule, That whatſoever is alcaleſcent, is heating; whatſoever is aceſcent, is cooling: And as the Qualities of Plants are more various than thoſe of Animal Subſtances, a Diet of ſome Sorts of Vegetables may be more effectual in the Cure of ſome Chronical Diſtempers, than an Animal Diet; Vegetables indeed abound more with Aerial Particles, than Animal Subſtances, and therefore are more flatulent.

From what has been ſaid, it manifeſtly appears, that if the Veſſels are relax'd by any Perſon's living too long upon one particular Kind of Diet, that he, by living upon a proper Diet, may have 'em brac'd up again to their proper Tone, and *vice verſa*; and hence alſo it is eaſy to determine the Rules of Diet in the different natural States as well as in the different morbid States of a Human Body. Hence alſo it appears, that what is one Man's Meat, is another Man's Poiſon; as *Lucretius* ſays, *Lib.* 4, *v.* 640, &c.

Tantaque in his rebus diſtantia differitaſque eſt,
Ut quod aliis cibus eſt, fuat acre venenum.

§ 12. The Intentions of Drink are *Firſt*, as a Vehicle (*t*) to convey our Nutriment to the reſpective Parts. 2*dly*, To dilute the Blood, that it may circulate thro' the minuteſt Veſſels. 3*dly*, To diſſolve and carry out the ſuperfluous Salts by Urine, they being durable and unalterable Bodies.

The Intentions of Drink, how many, what they are, and what anſwers them beſt.

All theſe Intentions are beſt anſwer'd by pure Water, for no Liquid that we drink, will circulate ſo well, nor mix ſo intimately with the Animal Fluids as Water; for all other Potables are impregnated with Particles that act, either upon the Solids, or Fluids, or both; but Water being altogether inactive, is the moſt proper, innocent Diluter; which, tho' it is only a Vehicle, yet bears a great

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(*t*) Boerhaav. Chem. Vol. 1. pag. 615.

great Share in the Compoſition, even of the moſt ſolid Parts; for Bones that have been dried and kept, 'till they were almoſt as hard as Iron, afforded by Diſtillation, half their Weight of Water; and from the Tendons of an Ox Dr. *Langriſh* (*u*) procur'd, very near $\frac{13}{16}$ Parts of Water.

Nothing will anſwer the 3d Intention ſo well as Water, that being the proper Menſtruum for all Kinds of Salts (*w*), and ſaponaceous Things (*x*). All the Animal Juices, except Fat, diſſolve in Water, and that alſo, when ſufficiently mix'd with Salts. The Lenity of Water ſhows it was deſign'd for our common Drink, for if it be drop'd upon the Cornea of the Eye, (which is as ſenſible as any Part) it will not cauſe the leaſt Pain; and if ſnuffed up the Noſe, where the Nerves are almoſt bare, it will not give the leaſt uneaſy Senſation; nor even in Ulcers

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(*u*) Theor. & Prac. pag. 19. Boerhaav. Chem. Vol. 1. pag. 618.

(*w*) Boerhaav. Chem. Vol. 1. pag. 568, 572, 728, and 729.

(*x*) *Ib.* pag. 583, 731, 732, and 733.

cers where the Nerves are quite naked, provided it be of the ſame Degree of Heat as the Blood, but will rather eaſe than increaſe the Pain: Hence it may be call'd an Anoydne (*y*). Pure Water will never putrefy, or alter in any Reſpect, as will appear by Experiments (*z*).

Purity, &c. of Water.

§ 13. The ſooner Water boils and cools again, the clearer, more inſipid, lighter (*a*) and freer from any Mixture of any Kind of Matter whatſoever, the better and more wholeſome it is: Hence the beſt and moſt pure Water, is from Hail melted, that being the very ligheſt Parts of Water, which aſcend to the higheſt Regions, and is there congeal'd (without

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(*y*) Boerhaav. Chem. pag. 566, and 567.

(*z*) *Ib.* pag. 624. *Boyle*, Tom. 1. pag. 62. Hamelius, Hiſt. Acad. Reg. Scientiar. Tom. 4. pag. 109.

(*a*) *Hippocrates*, Lib. de Aere, Locis, & Aqua, pag. 284, and 285. Herodot. Lib. 3. Cap. 125. Αἰθίοψ ἔτεα μὲν εἴκοσι καὶ ἑκατὸν βιοῖ· τίνες δὲ καὶ ὑπερβάλλουσι καὶ ταῦτα· σῖτος δὲ ἐστὶ κρέατα ἑφθὰ καὶ πόμα γάλα. ἐστὶ ἐκεῖ ὕδωρ ἀφ' οὗ οὐδὲ ἐπιπλεῖ, μήτε ξύλον, μήτε ξύλω ἐλαφρότερα, ἀλλὰ πάντα χορέει εἰς βύσσον καὶ διὰ τοῦτο τὸ ὕδωρ μακρόβιοι εἰσι. *Æthiops annos quidem viginti & centum vivit, quidam vero & ſuperant hos. Alimentum ipſis eſt Caro cocta & potus Lac. Eſt ibi Aqua ſupra quam nihil innatat, nec Lignum, neque Ligno leviora, ſed omnia deſcendunt in Fundum, & per hanc Aquam longævi ſunt.*

(without any Kind of Mixture with other Particles) into one homogeneous Subſtance. Next to this in Purity (if in calm Weather) is Snow melted (*b*) which then may be kept good ſeveral Years; it diſſolves Soap beſt of any, and will ſooneſt boil and cool again, but is never ſofter for boiling, which moſt other Kinds of Water are. *Bartholine* (*c*) ſays, "That if the Ice of Sea Water be thaw'd, "it loſes its Saltneſs, as has been lately "try'd by a Profeſſor of our Univerſity" *viz. Copenhagen*; and thaw'd Ice of Sea-Water is often us'd in *Amſterdam* to brew withal. When Water freezes, (which ſeems to be its natural State) whatever heterogeneous Particles are diſpers'd in it, before it begins to freeze, ſeem now to attract their reſpective Particles (which were before diffus'd in the Water) into one homogeneous Body. Thus we ſee the Air, which was equally diffus'd in the Water before it froze, now unites and forms little

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(*b*) Boerhaav. Chem. Vol. 1. pag. 598, 599, 601, 603, 604, 740, 741. Boyl. Med. Hydroſt. 104. I have never made the Experiment, whether what is here ſaid be Fact or not; but I can depend very ſafely upon the Veracity of the acurate and learned Author.

(*c*) Lib. de Nivis Uſu.

tle Bullulæ; and if a Bottle of Wine be ſet out of Doors 'till it be froze, the Water will cloſely unite into one ſolid Body, while the moſt vinous, ſpirituous Parts unite into another.

Rain Water is impregnated with almoſt all Kinds of Exhalations and Effluvia, which vary according to the different Seaſons of the Year, more eſpecially in ſtormy Weather; which, if let ſtand in a Veſſel, will ſoon putrefy, and produce various Kinds of Animalcules. There is ſcarce any Kind of Spring-Water, but what is impregnated with ſome Kind of mineral Particles. River Water is a Colluvies, having in it, not only what it's Springs contain, but alſo all the Filth of the Streets, Channels and common Sewers of ſeveral Places waſh'd into it, beſides the Fæces of ſeveral Kinds of Creatures that live therein.

Fen Water is much heavier than any; (*d*) *Boerhaave* ſays, twelve Ounces of this

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(*d*) Chem. Vol. 1. pag. 612.

this being put into a clean Glaſs Veſſel, and by a gentle Heat being evaporated, left many Worms, Inſects, and Animalcules at the Bottom of the Veſſel, beſides a great Quantity of Earth, Slime, *&c.* From what has been ſaid we ſee, that all Waters which have either Taſte or Smell, are impregnated with Salt, Sulphur, or ſome ſuch Thing, and conſequently not proper for healthy People to drink, as their common Diluent.

Too little Quantity of Drink.

§ 14. Too little Quantity of watery, cooling, diluting Drink, in Proportion to the ſolid Aliment, will make the Chyle, and whole Maſs of Blood too thick, and viſcid : The ſeveral Excretions, and Secretions, will be diminiſh'd : The ſaline, and oleaginous Particles not being ſufficiently diluted for Excretion by the ſame Ducts, will neceſſarily be accumulated in the Blood, whereby they will irritate, corrode, and paſs with Difficulty thro' the minuteſt, Capillary Veſſels.

§ 15.

§ 15. Too great a Quantity of watery Drinks, will render the Blood too ſerous, and relax the Fibres; hence Dropſies, Leucophlegmatia's, *&c.*

Too great a Quantity.

§ 16. From what has been ſaid, we ſee that Water is the beſt and moſt wholeſome Drink for an healthy, robuſt Perſon; but in ſuch Conſtitutions, where ſomething is neceſſary to warm and act as a Stimulus, then Spirituous Liquors, *&c.* are proper, ſuch as Ale, Beer, Wine, Cyder, *&c.* the Quantity, and Choice of which, depends upon the Conſtitution, and Age of the Drinker; in Youth, Water, or Milk mix'd therewith, or Whey; in the middle Age, ſometimes a little more generous Liquors may be proper; but moſt of all ſo, in old Age; for then they ſhould leſſen the Quantity of their Food, as they advance in Years, as the famous *Italian Cornaro* did, and make Uſe of more generous Liquors.

Where Spirituous Liquors are neceſſary.

§ 17. It wou'd be endleſs to enter into a long Account of the different Kinds

A ſhort Account of different Liquors.

and Sorts of ſuch Spirituous Liquors; I need only in general ſay, That Malt Liquor is moſtly relaxant, and thickening; and the nearer it comes to the Nature of Wine, the better it is; therefore it ſhould be made up of Water that will bear Soap, be well hop'd, that it may keep 'till all the groſs viſcid Parts are fallen to the Bottom of the Veſſel. Red Port Wine is aſtringent. White *Portugal* and *Spaniſh* Wine is attenuant and ſtimulant. *French* Wines, eſpecially *Burgundy* and *Champaign*, are not ſo ſtrong as the *Portugal* and *Spaniſh* Wines; they contain more Spirit, but leſs Oil than theſe laſt mention'd; hence they are worſe for thin, dry Conſtitutions. Punch is thickening, cooling (if ſmall), and diuretic. Cyder is cooling, and attenuant: And all Made Wines are windy.

The Effects of too free an Uſe of Spirituous Liquors.

§. 18. Too free an Uſe of ſtrong Spirituous Liquors will inevitably deſtroy both the Tone of the Solids, and the Craſis of the Fluids, by the ſtimulating and ſtrongly contracting Power of acrid, fiery, cauſtic, ſaline, and ſulphureous Particles, wherewith they abound.

We are aſſur'd, by many obvious and undoubted Experiments, that ſtrong Spirituous Liquors will coagulate the Blood and Lymph; and tho' for a Time, they may ſeem to contract, and ſhorten the Fibres, and alſo to give freſh Force and Vigour to them; yet in the End, they will certainly corrode, abrade, and wear away ſome of their conſtituent Particles, and render them thinner and weaker. Hence the Chearfulneſs, and ſudden glowing Heat, which diſtill'd Spirituous Liquors give to the poor, unhappy, habitual Drinkers thereof, ſoon ceaſe, and end in a cold, relax'd and languid State, whereby the Sufferings of theſe People become very grievous; becauſe nothing will give them immediate Relief, but the ſame baneful Liquors, which were the Foundation of all their Miſeries. It would be very happy for Mankind, if they would follow the Cuſtom of the Ancient *Perſians*, *viz.* only to drink when thirſty, and then give over (*e*).

(*e*) Zenoph. Cyropædia, Lib. 1.

The firſt Organ that generally is affected by habitual Drinking, is the Stomach; whoſe inner, villous Membrane is almoſt abraded and worn off, thereby expoſing its nervous Coat to the Inſults of the moſt ſharp, acrid, fiery Particles; by which means, the Springyneſs or Elaſticity of the Fibres is enfeebled, and the whole Stomach becomes ſoft, flabby and relax'd. Hence a Want of Appetite, and an Inability to digeſt the little that is taken in; whence Crudities, Nauſea's, Vomitings, *&c.*

The Signs of the Functions of the Stomach being deprav'd, are Pains in it many Hours after Repaſt, Eructations either with the Taſte of the Aliment, acid, nidorous, or fœtid, reſembling the Taſte of rotten Eggs; Inflations, or a Senſation of Fulneſs, Sickneſs, Hickup, Vomiting, a Fluſhing in the Countenance, Foulneſs of the Tongue: In general, whatever be the State of the Tongue, the ſame is that of the inward Coat of the Stomach.

CHAP. IV.

On EXERCISE.

The Medicinal Uſe of Exerciſe, how firſt found out, and how eſteemed by the Ancients.

Herodicus (*a*), *Hippocrates*'s Teacher, being Maſter of one of the *Græcian Palæſtræ*, or *Gymnaſia*, obſerv'd, that the Youths under his Care, who took their proper Exerciſes, were in general very healthy and ſtrong; he thence began to impute it to their conſtant exerciſing; he indulg'd this Thought, and begun to eſtabliſh it as an Art to preſerve, or recover Health by, under certain Rules and Precepts, which have been loſt for many Ages; but however were once in great Eſteem. Hence he may be call'd the Inventor; but *Galen* (*b*) expreſsly aſſures

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(*a*) Le Clerc, Hiſtoir. de la Medicin, Part I. Lib. 2. Cap. 8. pag. 98, Barcheuſen de Medicinæ Origine Diſſertat. 8.

(*b*) De ſanitate tuenda, Cap, 8,

us, that *Æſculapius* (who, as *Diodorus* informs us (*c*), liv'd in the Time of the *Trojan* War) actually preſcrib'd Exerciſe of various Kinds to his Patients; and therefore, he ſays, may very well be counted the Inventor: Be that as it will, *Herodicus* was the chief Improver; for on the one Hand, his Rules regarded the Exerciſes that were proper for each Conſtitution, Age, Sickneſs, *&c.* And on the other Hand, the Diet proper for each Kind of Exerciſe.

Theſe were no ſooner known, than he had many Followers, as *Diocles*, *Caryſtus*, (a Cotemporary with *Ariſtotle*) *Praxagoras*, *Eraſiſtratus*, *Herophilus*, and *Philotimus*, among the *Greeks*; *Æſclepiades*, and almoſt all the Methodiſts, a Sect amongſt the *Roman* Phyſicians, one of the moſt famous of whom, was *Aretæus Cappadox* (*d*), the firſt Inventor of Bliſtering by Cantharides (he liv'd in the Reign

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(*c*) Lib. 5. pag. 341.

(*d*) *Rome*, at this Time, had moſt of her Phyſicians from other Countries, eſpecially from *Greece*; hence we call a *Greek*, if he practic'd at *Rome*, a *Roman Phyſician*.

Reign of *Auguſtus*) and alſo *Celſus*, and *Auguſtus*'s Phyſician *Antonius Muſa* (who was as great a Promoter of cold Bathing, as *Medea* was of warm, in the 28th Century of the World). Bathing and Friction were held in great Eſteem by *Galen* (who liv'd in *Adrian*'s Reign, *Anno Dom.* 131) which he us'd as they deſerv'd, as may be ſeen in his Book *De Sanitate Tuenda*; they both were much in uſe for many Centuries. Had not Mankind, by Luxury, Intemperance, and an idle, ſedentary Life, brought various Kinds of Diſeaſes upon themſelves, theſe Sort of Remedies wou'd never have been thought of; but as the Phyſicians obſerv'd the Health and Vigour of the Active and Laborious, they then thought of ſubſtituting various Kinds of Exerciſes, appropriated to each Diſtemper. The *Græcians* in general, the *Athenians* and *Lacedæmonians* in particular, erected Academies, Gymnaſia, or publick Places for all Kinds of Exerciſes, both to train up the People for War, and to preſerve 'em from, and cure their Diſeaſes; thither Phyſicians ſent all thoſe, who labour'd under Chronical Diſtempers. Tho' Experience, which confirms the Benefit of this Remedy, is a very ſolid Foundation to go upon, yet the Reaſon of the Thing ſpeaks ſo loudly, that it can't but be hearken'd unto by every reaſonable Perſon.

From what has been ſaid, we ſee the Eſteem the *Greeks* and *Romans* had for this Part of Non-naturals; and if we look yet farther back, we ſhall find the *Ægyptians* entertain'd but a mean Opinion of that Sort of Exerciſe, which did not contribute to invigorate the Body, or give a vigorous Health; nor of Muſick, which they conſider'd as an uſeleſs and dangerous Diverſion, and only fit to enervate the Mind. Τὴν δὲ μουσικὴν νομίζουσιν οὐ μόνον ἄχρηστον ὑπάρχειν, ἀλλὰ καὶ βλαβερὰν ὡς ἂν ἐκθηλύνουσαν τὰς τῶν ἀνδρῶν ψυχάς. (*e*). We ſee alſo that the *Perſians* look'd upon Exerciſe as neceſſary and uſeful; for we read in *Xenophon's Cyropædia*, that *Cambyſes*, King of *Perſia*, ask'd his Son *Cyrus* (who had been ſaying,

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(*e*) Diod. Lib. 1. pag. 73. *Rollin.* Anc. Hiſt. Vol. 1. pag. 55.

ſaying, he had learnt whatever was neceſſary for the Command of an Army) "If his Maſter had taught him to prevent the Diſtempers incident to his "Army, to cure 'em when ſick, and to "ſtrengthen their Bodies by frequent "Exerciſes (*f*).

Hence we ſee the *Ægyptians* and *Perſians* as well as the *Greeks* and *Romans*, founded a great Part of the Cure of Diſtempers, no leſs than the preſervative Means of Health, upon Exerciſe in it's various Degrees and Kinds; and *Sydenham*, our own Countryman, has launch'd out in it's Praiſes, as one of the moſt ſovereign Remedies, as it prov'd to ſeveral by taking long and frequent Journies on Horſeback; and the learned *Boerhaave* is not behind him in it's Commendations, he (to my Knowledge) having wrought great Cures by that, and a right Management of ſome others of the Non-naturals, when all Attempts by other Means have fail'd of Succeſs.

§ 2. It

(*f*) *Roll.* Anc. Hiſt. Vol. 2. pag. 88.

A Mechanical Account how it is beneficial, and why preferable to Medicines.

§ 2. It was proved in the *Introduction*, that the quickeſt Way of altering the State of the Fluids, was by affecting the Contractions of the Solids; and we alſo know that all Bodies whatſoever attract and are attracted by each other; by Virtue of which Power, in any heterogeneous quieſcent Fluid, there always will be an inteſtine Motion of its conſtituent Parts, 'till the Coheſions of ſuch Parts as were before ſeparate are perfected: Now, this inteſtine Motion and Coheſion is in a great Meaſure prevented by the continual Agitation of the containing Veſſels; or 2*dly*, By the Blood's Propulſion thro' ou Veſſels, which are conical and diſtractile For in the firſt Caſe, the Motion of al containing Veſſels will communicate and impreſs ſuch Motions upon the ſeveral Parts of the Fluid, as are contrary to the Direction of their ſeveral attractive Powers, and therefore are ſo deſtructive of their natural Coheſions, as to cauſe thoſe Parts frequently to recede from one another, which otherwiſe, when left to obey their own proper Attractions, would run into cloſe Contacts with each other, as we ſee in Blood ſtagnating in a Veſſel after Venæſection. In the latter Caſe, altho' the Fluid be propell'd, at its firſt ſetting out in a Direction parallel to the Axis of the Canals, yet their Conical Figure will all the Way give ſuch Reſiſtances to ſome of its Parts, as to deflect 'em from their firſt Directions, and thereby make ſuch a continual Shifting and Changing of the Poſitions of the ſeveral Particles, with Relation to one another, (being ſometimes at the Centre, and ſometimes at the Sides) as is inconſiſtent with theſe Coheſions, as in Obedience to their mutual Attactions, they otherwiſe wou'd be drawn into. This being premis'd, it will eaſily appear, that whatſoever Force prevents theſe Coheſions, will attenuate; and the different Degrees of Fluidity of the Blood, are as their Velocities, (if no greater than natural) and their Velocities are as the contracting Force and its Reſiſtances: We know alſo, that all the Excretions are, as the *Vis applicationis liquidorum ad oſcula vaſorum*; ſo that by how much more the Blood is mov'd, by ſo much more are (*cœteris paribus*) the Excretions increas'd. We know alſo by Anatomy, that all the Parts of the Muſcles receive Blood by the Arteries and return the ſame by the Veins: as alſo, that long Branches of the Arteries run betwixt the Muſcles, which carry Blood to the more remote Parts: Hence by Muſcular Motion, *i. e.* Contraction and Dilatation, they (the Muſcles) muſt interchangeably preſs forward the Blood; (this is evident, for when the Vein is open'd in the Arm, if the Fingers and other Muſcles be ſtirr'd, the Blood is immediately drove out with a conſiderable Force) and as the Arteries are elaſtic, the greater the *vis impellens* is, the greater will be the *vis propellens* of the Veſſels, quite thro' the whole Circulation; ſo that all the Parts by this Means are nouriſh'd, and the Viſcidity of the Humours are broken.

The very Mechaniſm of the Veſſels alone, is ſufficient to ſatisfy us of the Neceſſity of Exerciſe; for, as they all terminate in a Cone, they reſiſt the Paſſage of the Blood, and therefore require frequent Preſſure and Motion of the Muſcles to forward the Circulation, which we always find much augmented by ſuch Means: Hence we ſee, it has the Preference of all Medicines, that as theſe are generally given to promote and increaſe ſome of the Secretions, (and by that Means may leſſen ſome or all the reſt, as *Sanctorius* obſerves); this (*viz.* Exerciſe) promotes and increaſes all the natural and neceſſary Evacuations, as well as diminiſhes the ſuperfluous and hurtful. This Neceſſity of proper Exerciſe is ſtill more confirmed by an Obſervation of St. *Chryſoſtom* (*g*), *viz.* "That "a rich Man ſtretch'd upon a Bed of "Down ſhall ſeek for Reſt, but in vain; "Sleep flies from him, and refuſes to "cloſe his Eye-Lids in the ſtilleſt Night: "Whereas the Poor, who has labour'd "all Day, only throws his wearied "Limbs upon the Bed, and ſtreight he "ſinks into a ſweet and gentle Sleep; a "Sleep that is ſound and uninterrupted, "the juſt Recompence of all his Toil."

§ 3. From

(*g*) Homil. 2. and popul. Antioch.

The Effects of too much, or too little Muſcular Motion.

§ 3. From what has been ſaid we may eaſily gather, that by too much muſcular Motion, the Circulation will be too violent and quick; whence all the Evils will ariſe, which are mention'd under a too rigid State of the Fibres; and alſo by too much ſuch Motion, all the medullary or oily Matter, that lies between the Muſcles will be conſum'd, as well as the Mucus that lubricates the Joints: This Waſte is the Reaſon of that uneaſy Stiffneſs or Wearineſs which we feel after immoderate Exerciſe. On the other Hand, too much Reſt, or an idle, ſedentary Life, relaxes and weakens the Fibres, thickens the Blood, and hinders the Secretions and Excretions of the whole Body; whence all theſe Diſorders will follow, which are mentioned under the too weak State of the Fibres, and too viſcid State of the Fluids.

How to make Exerciſe the moſt beneficial.

§ 4. There are three Conditions of Exerciſe to make it the moſt beneficial that may be.

Firſt, That it be upon an empty, at leaſt not a full Stomach ; for thereby the now concocted Matter will be readieſt diſcharged : *Cocta non cruda ſunt evacuanda*, ſays *Hippocrates* ; for upon a full Stomach Exerciſe would hurry on the Humours faſter, than they are digeſted: Hence the Reaſon of that old Proverb,

After Dinner ſit a while,
After Supper walk a Mile (*h*).

Secondly, That it be not continu'd to downright Laſſitude, Depreſſion of the Spirits, or a melting Sweat ; as *Celſus* ſays (*i*), the firſt will wear out the Organs ; the ſecond ſpend their Strength ; and the third will only do Violence to the Natural Functions.

Thirdly, Due Care muſt be taken not to catch Cold after Exerciſe.

To

(*h*) This implies we ſhould always eat light Suppers ; *Ut ſit ſomnus levis, ſit tibi cæna brevis.*

(*i*) Pag. 13. Cap. 2. Exercitationis autem plerumque finis eſſe debet ſudor, aut certe laſſitudo, quæ citra fatigationem ſit idque ipſum, modo minus, modo magis faciendum eſt.

To Theſe ſhould be join'd Temperance; for ſince Exerciſe will create an Appetite, if it be indulg'd to the full, the concoctive Powers will be as unequal to the Load as they were before.

§ 5. Exerciſes of the Body may be divided into Three Kinds.

I. That of being carried, as on Horſeback, Chair, *&c.*

II. That of ſimple Muſcular Motion.

III. That from outward Application, as cold or warm Bathing, Friction, *&c.*

Exerciſe by Carriage.

Firſt, Of all Exerciſe by Carriage, that on Horſeback is by much the beſt, eſpecially on a Trotting Horſe, notwithſtanding *Sanctorius* (*k*) ſays to the contrary, *viz.* "That amongſt the Riding Paces, the Amble is the moſt wholeſome, as the Trot is leaſt ſo." There is certainly a great Dif-

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(*k*) Aph. 27. § 5.

Difference as to the Paces, one being more agreeable and advantageous in ſome Caſes and Conſtitutions, than the other; which a judicious Perſon will ſeldom fail to foreſee: But that he ſhould ſay, the Amble is beſt, and Trotting the worſt, is not eaſily conceiv'd; for they can only be relative, according to the Conſtitution, the former not giving ſuch ſtrong Concuſſions to the Fibres, as the latter; and therefore may be more proper for weak People, who cannot bear a greater Motion; but the latter, for the ſame Reaſon, is to be preferr'd, where the Body wants to be ſhook more forcibly, and is able to bear it: It is alſo certainly the moſt advantageous of all, in Obſtructions of the Viſcera and Head, as it ſhakes thoſe Parts in particular more than others.

Next to Riding on Horſeback, an open Chair or Chaiſe is beſt, for the cloſer the Vehicle the worſe.

One Advantage by the Exerciſe of Riding, is the continual changing and breathing freſh Air; the Good of which the

Reader already knows. Some cannot bear the Shaking of either Horſe or Chaiſe, and ſuch may venture, in a well choſen Hour, to take the Benefit of the Change of Air in a Boat (*l*).

Secondly, The 2d Kind mention'd before, is *Muſcular Motion*, properly ſo called; of which, Walking is one Sort; which, tho' it do anſwer the End as well in ſome Caſes, yet it is more laborious and tireſome to the inferior Limbs, ſo that the Perſons cannot uſe it ſo much as Riding.

When the Weather will not permit Exerciſing in the open Air, which is ever to be prefer'd when it can be ſafely had, home Employments that have Labour in them are to be diligently follow'd, of which there is vaſt Variety, and the meaneſt of which, is to be preferr'd to Idleneſs, or ſitting from Morning 'till Night, ſtaring at the Fire. Thoſe who have a Genius for Mechanics have a great Advantage

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(*l*) Celſus, Lib. 2. Cap. 15. pag. 91.

tage above others in this Particular, not only as their Labour may be made of ſome little Uſe to 'em, but becauſe Exerciſe of this Kind is a perpetual Entertainment to their Underſtanding, and engages kindly their whole Man; thoſe Exerciſes being juſtly obſerv'd to be moſt beneficial to the Body wherein the Mind has its Share. But thoſe who (for want of Taſte in theſe Matters, or which is worſe, out of a falſe Senſe of the Diſgrace of thus acting the Mechanic, choſe rather to throw away their Labour) may procure a dumb Bell, and haul at that for Hours every Day; or, what anſwers pretty near the ſame End, may ſwing Leads, made fit for the Graſp, in their Hands; a Thing much us'd by the Students in our Univerſities. Ringing has many peculiar Excellencies in it, for it not not only exerciſes the Muſcles of the upper Parts of the Body, but alſo opens the Cheſt, thereby giving more Room to the Lungs to play: But the Value of this Exerciſe is much let down when perform'd in Belfries, by the ill Air that is uſually breath'd in thoſe Places.

Thirdly, The 3d Kind of Exerciſe is from outward Application, as cold or warm Bathing, and Frictions.

Bathing of both Kinds ſhar'd the ſame Fate with ſome other of the Non-naturals, in being neglected in a medicinal Way, and being almoſt quite laid aſide for many Ages, notwithſtanding it was in ſo great Eſteem among the Ancients, as many Authors inform us, which there is no Neceſſity to mention here: They who want to be ſatisfied as to that, may read *Hoyer*'s, *Barnard*'s and *King*'s Treatiſes on Cold-Bathing; wherein they will find many Inſtances of the ſurpriſing Cures it has perform'd in Scurvies, Cachexies, Rheumatiſms, Looſeneſſes, Swellings, *&c.*

As Bathing, either hot or cold, has very different Effects in different Caſes and Conſtitutions, being in ſome Caſes beneficial, in others prejudicial; it will therefore be neceſſary to enquire what Alterations are made by it in an human Body, that ſo we may know in what Caſes to order it. I ſhall begin with Cold Bathing, which acts in a double Capacity, both as a cold and a heavy Body. It has been already obſerv'd in treating of Air (*m*), that Cold contracts the Fibres, and the more ſuddenly it is apply'd to our Bodies, the more violently it operates; but to what Degree it contracts, we are not able to determine, having no Rule by which we can meaſure it. It was obſerv'd alſo in the ſame Chapter (*n*), that our Bodies underwent various Changes by the Alterations in the Weight of the Atmoſphere; Water is about Eight hundred Times heavier than Air, what Alterations then muſt we be ſenſible of upon Immerſion into cold Water? The Cold and Weight acting conjointly will contract and ſtraiten the Fibres and Veſſels throughout the whole Body, more eſpecially the external Parts; and as theſe Ends which are compaſs'd by a greater Preſſure, are more effectualy obtain'd by whatever increaſeth the Weight of the Water, or contracts the Fibres of our Body, ſo Salt Water

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(*m*) Sect. 12. pag. 74.
(*n*) Sect. 14. pag. 81. of Air.

is preferable; upon both which Accounts, all the Humours muſt be propell'd with greater Force thro' the Veſſels, in which they circulate, and will alſo be more broken, better digeſted, and be made fitter to paſs the Glands and ſmall Veſſels; beſides, as the Blood will be drove more into the inward Veſſels, the Secretions of all Kinds will be the more increas'd (*o*); hence a greater Quantity of Animal Spirits, of Urine, of Gall, of the Pancreatic Juice, Perſpiration, Semen, *&c.* And as the Humours are puſh'd forwards with greater, ſudden Force, they will remove any Obſtruction that is not too obſtinate and fix'd; ſo that, if we would have the Blood diſſolv'd, any viſcid Matter adhering to the Sides of the Veſſels remov'd, the Glands ſcour'd, a greater Quantity of Animal Spirits ſecreted, and drove with greater Celerity thro' the Nerves, or would force Urine, or remove Obſtructions of the Liver, Spleen,

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(*o*) The Quantity of fluid Matter ſeparated in any Gland, is in a compound Proportion of the Quantity of Blood, its Celerity at the Orifices of the excretory Veſſels, the Wideneſs of Orifices of theſe Veſſels directly, and the Viſcidity of the Blood reciprocally.

Spleen, Pancreas, and meſenteric Glands, we ought to order Cold Bathing: In ſhort, whatſoever is to be effected by bracing up the Solids, invigorating and quickening their Vibrations and the Circulation, is with Certainty to be had from Cold Bathing; all Diſeaſes therefore from a viſcid State of the Blood (if the Elaſticity of the Veſſels is not too weak with Age, Diſeaſes, or Debauchery) will find Relief from this Practice. Whatſoever Inconveniencies proceed from the Humours obſtructing near the Surface, which can't get thro' the Skin, this will relieve; for upon Immerſion, the whole nervous Syſtem is ſo ſhook, that the very Capillaries and minuteſt Paſſages are forc'd open, by ſuch a ſuddenly increas'd Velocity of the circulating Fluids, whereby the Skin will be clear'd, and inſtead of retaining groſs, acrimonious Humours in the cuticular Glands and Veſſels, will promote inſenſible Perſpiration: This is the Reaſon, why People an Hour or two after Bathing ſeem to be ſo briſk and lightſome. Hence we ſee Cold Bathing is proper in moſt Sorts of cutaneous Eruptions, Leproſy,

proſy, and Elephantiaſis; ſome Palſies, Melancholies, Madneſs; moſt Kinds of Cachexies, ſome Icteric, and Hydropic Caſes, Fluor Albus, Rheumatiſms, Lameneſs, and moſt Scurvies, Chloroſis, and nervous Atrophies.

Rules to be obſerv'd in Bathing.

§ 6. Notwithſtanding all the fine Encomiums that have been beſtow'd on cold Bathing, it has done Miſchief, which is entirely owing to Errors in the Perſon himſelf; for either he has bath'd at improper Times, in an improper Manner, or perhaps in improper Caſes, or has not taken Things proper for the Caſe; wherefore it will be neceſſary to ſhow what Cautions are to be taken, and what Method is to be follow'd in each Caſe.

As the Deſign of the cold Bath is to ſtrengthen the Solids, and break the Viſcidity of the Fluids by a ſudden Shock, it would be ridiculous for any Perſon, who wants ſuch a ſudden Contraction, to ſtay in the Water ſo long, as 'till it exerts it's relaxing Quality, which would fruſtrate the very Deſign of cold Bathing;

ſo that inſtead of ſtrengthening, would really weaken, as we find it does, by Swimming too long, or being too long in the Water; for though cold Water, by it's ſudden Application to our Fibres, does contract, yet if it has Time, it will exert it's moiſtening Faculty. The propereſt Method, where ſuch an Intention is neceſſary, is to leap into the cold Bath, but that muſt be within proper Reſtrictions; for if the Perſon have any of the Veſſels of the Viſcera or Head in the leaſt weaken'd more than the others, this precipitant Jumping into the cold Bath will endanger their burſting; the ſafeſt Way therefore would be to walk in Step by Step; tho' this latter Method is apt to bring a Pain in the Head in thoſe of tender Nerves, by driving the Blood into it, in which Caſe I would adviſe 'em to throw Water upon their Heads and Shoulders before they go in, which will prevent the Head-ach.

People ought not to bath when they are hot or ſweating; with proper Precaution they may bath all Summer, and, in many Caſes, all Winter too; but before they begin to bath, they ought to uſe ſome Evacuations, as Bleeding, Purging, or Vomiting, or any other, as the Nature of the Caſe and Conſtitution require, which none but the Phyſician, who examines the Perſon, can tell. It were well if every one, who intends to bath for the Recovery of his Health, would adviſe with his Phyſician, what he is to do, both before, at the Time, and after Bathing, leaſt he make his Diſorder incurable, as ſeveral have done.

People ought never to bath upon a full Stomach, becauſe as there is leſs Blood in the lower Viſcera in a full, than in an empty Stomach (*p*), ſo by increaſing the external Preſſure, they may endanger an Apoplexy, or Extravaſation of Blood in the Head or Lungs; moreover a more groſs Chyle will, by theſe two contrary Preſſures, be forc'd into the Blood, the Conſequence of which I need not mention

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(*p*) *Hales*'s Hæmaſt. pag. 182. Exp. 23. § 7 and 8. and in this Treatiſe, Chap. 3. § 4.

tion here, having already treated upon it (*q*). Neither ſhould any uſe cold Bathing after hard Drinking, becauſe their Blood is at that Time ſomewhat inflam'd. The Diet ought to be thin, and of eaſy Digeſtion, leaſt the Chyle enter into the Blood in a too viſcid State; it ſhould alſo be compos'd of ſuch Things as are proper for the particular Caſe, which may be found in the Chapter on Diet in this Book.

The beſt Time for Bathing is in a Morning before we eat any Thing; becauſe at that Time all the Digeſtions being near, or quite compleated, the Veſſels will be more at Liberty to exert all their Force to break that Viſcidity of the Blood, for which the cold Bath is us'd, and will alſo then promote a freer Diſcharge of the perſpirable Matter: Beſides, the Veſſels not being employ'd upon Digeſtion, or not being upon the full Stretch, are more eaſily brac'd up and brought to their proper Tone.

§ 7. From

(*q*) In the Introduct. § 15. pag. 22.

Wherein Bathing is improper.

§ 7. From what has been ſaid we ſee, that many Perſons labouring under Chronical Diſtempers may reap great Benefit from cold Bathing; if Corpulence, a too weak State of Fibres, unſound Viſcera, a Plethora, or inveterate Obſtructions do not prohibit: For firſt, in fat People the Veſſels are ſo ſtuff'd, that they have no Room to vibrate and contract, and are moſt lax withal, ſo that by inforcing their Springs, they are only ſtrain'd to no Purpoſe, and conſequently weaken'd thereby: Secondly, in a too weak State of Fibres it is bad, becauſe wherever an Effort is made to remove any Thing by an elaſtic Body, if the firſt Exertion fails, every Impetus afterwards languiſhes, and the Spring is ſpoil'd: Thirdly, where the Viſcera are unſound it is improper, becauſe the Veſſels are either weaken'd or deſtroy'd; in either Caſe, there will be leſs Reſiſtance in thoſe, than in other Parts, whence the Humours, upon Immerſion into cold Water, will be drove more thither, than to any other Part; for *qua data Porta ruunt*, and ſo will either burſt the Veſſels, or promote the Diſcharge of ſome ill Humours there: Fourthly, in a Plethora it is bad, becauſe by preſſing all the outward Veſſels of the Body, it may burſt, or obſtruct ſome of thoſe in the Head or Viſcera, where there is leſs Reſiſtence; hence Apoplexies, Vertigo's, *&c.* Fifthly, in inveterate Obſtructions it is bad, becauſe the more forceably the Humours are propell'd, the more they are rivetted and wedged in.

The Method in Bathing to be alter'd according to the Exigence of the Caſe.

§ 8. Different Methods in the foremention'd Diſeaſes are to be follow'd according to the Exigences of the Caſe. Thus in cutaneous Diſeaſes, which are not of too long a ſtanding, and where there is ſufficient Strength in the Solids, the cold Bath is proper; they ſhould only immerge over Head to give a ſtrong Vibration to the Solids, and get out of the Water again immediately; as ſoon as they are out of the Water, they ſhould uſe Frictions, either with a Fleſh-Bruſh, or with a very coarſe woollen Cloth, 'till the Skin looks red; for by the Cold, the Fibres will contract, by which Contraction the viſcid Humours will be broken, and by the brisker Circulation they will be ſent to the Circumference, and thence, by the dry Friction, their Exit will be promoted. The Sick (as I ſaid before) ſhould bath in the Morning, firſt drinking very plentifully of the Decoction of the Woods, or warm Whey; and as ſoon as the Bathing and Friction is over, they (if they can conveniently) ſhould go into a warm Bed again for about an Hour; becauſe the Warmth of that would promote a gentle Diaphoreſis; if they can't conveniently go into Bed immediately, they ſhould uſe brisk Exerciſe. The Diet ſhould be diluting, and of eaſy Digeſtion, and alſo ſhould be directed contrary to the ſuppos'd Cauſe and Acrimony. This Method ſhould alſo be follow'd in moſt Kinds of Scurvies, Leproſies, and Elephantiaſis. In Palſies the Diet ſhould be more ſtimulant and warming; the Frictions ſhould be warm with hot Cloths held in the Fumes of ſome of the warm Aromatics, ſuch as thoſe of Myrrh, Benjamin, *&c.* But if the Palſies be of a long ſtanding, or the Fibres too weak, they ought not to make uſe of the cold Bath; in all theſe Caſes the Air ſhould be warm and drying, to promote Perſpiration. In moſt Kinds of Cachexies and Scurvies this Method will do, always taking Care that the Diet be contrary to the Acrimony of the Humours; for if the Humours are alcaleſcent, the Diet ought to be aceſcent, and ſo of the reſt. In a Chloroſis, nervous Atrophies, Sciatics, and Rheumatiſms, the ſame Method will do, allowing ſome few Variations, according to the Caſes, which none can pretend to give Directions about, but thoſe who ſee the Patient; in a Chloroſis, the Diet ought to be detergent and ſaponaceous; in Jaundices, that ſpring from a too viſcid Bile, the ſame Method ſhould be follow'd, only the Diet ſhould be ſaponaceous, attenuant and diluting; the Patient ſhould drink plentifully of diluting Liquors. In dropſical Caſes it ſeems odd to preſcribe cold Bathing, but there are ſeveral Inſtances where it has done Service; for if they be recent, and proceed only from Want of an Exertion of the Veſſels, they may be eas'd by this;

in ſuch a Caſe, warm Frictions and a warm ſtimulating Diet would be proper; as well as in the Rickets, to which I know nothing preferable; in all theſe Caſes, Exerciſe on Horſe-back in particular is neceſſary in a warm, dry Air. This Method ſhould be follow'd by all, who have weak Fibres, whether partial or total; only with this Difference, that the Diet ſhould be aſtringent, warming and ſtimulant; hence it is proper in the Fluor Albus, œdematous Swellings, and many ſuch like Caſes. When we would have the cold Bath aſſiſt the Urinary Diſcharges, we ſhould omit the Friction; and before Bathing with this Intention, it will be neceſſary to drink plentifully of *Piermont*, Spaw-Water, or ſome ſuch like; and as ſoon as the Patient has done bathing, he ſhould ride a trotting Horſe a little; this Method will ſoon cleanſe the Urinary Paſſages; hence it is proper for thoſe, who are ſubject to the Gravel and ſlimy Matter in theſe Paſſages: The Diet muſt be diluting, ſtimulant and ſaponaceous; they ſhould uſe but little other Exerciſe than as mention'd above; becauſe the more they perſpire the leſs Water they will make, for the greater one Diſcharge is, the leſs will be the other. The ſame Method is proper for Hypochondriacs, with this Difference, that theſe ſhould uſe more Exerciſe; for by the Cold Bath, the Humours will make an Effort to remove the obſtructed Matter, and the plentiful Drinking of the Waters, will help to dilute the viſcid Matter in the Glands, and at the ſame Time will ſtimulate them.

The Uſe of warm Baths.

§ 9. As the Preſſure of Water is made more contractile by its Coldneſs, ſo is it's relaxing Power increas'd by a moderate Warmth; for a gentle Heat always relaxes our Fibres, ſuch as *Buxton* and ſeveral other Bath Waters: Hence People weary with Travelling, commonly go into the Bath for a little Time, and are eas'd; for Wearineſs being nothing but an over-ſtretching or too great a Tenſity of Fibres, muſt, upon their being relax'd, go off again. Warm Bathings are like a Fomentation, which ſupples and relaxes the external Fibres of the whole Body at once, and the longer the Sick ſtays in, the more will the Veſſels be relax'd, thus it opens the Pores, and promotes a free Diſcharge of the perſpirable Matter. Hence it is good in moſt cutaneous Eruptions, eſpecially where the Obſtruction is ſo obſtinate, that it will not yield to the Cold Bath, for it not only relaxes the Pores, but at the ſame Time dilutes the obſtructed Matter, by being abſorb'd, as appears by Mr. *Martin*'s Experiments at *Buxton* Well (which he related to me at his Return to *Cambridge*;) it is alſo mentioned in *Short*'s Hiſtory of Mineral Waters, pag. 59 (*r*). This is alſo confirm'd from what *Keil* ſays, (*s*) *viz.* that "Perſpiration will ariſe in one Hour to "half a Pound from bathing in warm "Water, nor will it afterwards be diminiſh'd by any ſuch Increaſe." From Mr. *Martin*'s Experiments it appear'd, *Firſt*, That warm Bathing encreaſes the Weight of the Body at preſent, tho' it cauſes a plentiful Perſpiration afterwards. *Secondly*, That the Perſpiration after this, is

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(*r*) Phil. Tranſ. No. 407. pag. 26 and 27.

(*s*) Med. Stat. Brit. Aph. 25.

is nothing near ſo large as *Keil* has ſaid juſt above; for by his Account, it amounts, we ſee, to half a Pound in one Hour's Time: But by Mr. *Martin*'s, it is but five Ounces in one Hour; and from eight Ounces and an half to a Pound in an Hour and Half, tho' aſſiſted by Motion; this Difference might eaſily happen and yet be both true; however, they both ſhew that much Water was abſorb'd by the Pores, tho' it cannot certainly be told how much, becauſe they could not know how much was perſpir'd, while they were in the Bath; however, more Water was abſorb'd than any one would imagine. Hence it dilutes and abates the Acrimony of the Humours, and is therefore proper in moſt ſcorbutic Habits, wandering Rheumatic and Sciatic Pains, Contractions of the Tendons, and in almoſt all Caſes proceeding from an obſtructed Perſpiration; hence it is good in ſome Gripings, Looſeneſs and Colics (*t*), Cramps, Convulſions, Contractions of the Muſcles, Stifneſs of the Joints, ſome Lame-

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(*t*) Chap. of Air, § 12. pag. 75.

Lameneſſes, *&c.* In ſhort, all the Advantages of a free Perſpiration may be gain'd this Way. Some People have denied, that there are abſorbing Veſſels, but this may be prov'd many Ways, eſpecially by raiſing a Salivation, by rubbing the Skin with Mercury.

In the Uſe of the warm Bath, the Diet ought in general to be thin and diluting, and of eaſy Digeſtion; for if the Humours are crude and not ſufficiently digeſted, this eaſy and general Relaxation will only occaſion a greater Derivation of them towards the Circumference. For the ſame Reaſon the beſt Time of Bathing is in the Morning, either in Winter or Summer.

Some few Immerſions in the warm Bath after previous Evacuations, are proper Preparatives for the cold Bath, in many Caſes.

In ſome Diſeaſes from Obſtructions, Sweating after warm Bathing is neceſſary; in ſuch Caſes they ſhould go into Bed again after Bathing, and follow the Rules given for cold Bathing. It is impoſſible for any one to lay down Rules for the Management of every Perſon, in all Caſes wherein Bathing is proper, for that would take up whole Volumes, and to little Purpoſe.

There is no aſcertaining the preciſe Time for Peoples ſtaying in the Water, for that muſt be determin'd according to the Degree of Heat requir'd, and the different Caſes to which it is adapted; and for which they muſt conſult their Phyſician.

The naturally warm Mineral Baths are much more proper in any Kind of Obſtruction than the Artificial; the firſt contain many volatile, ſtimulating Particles, which the laſt can never have; theſe Kind of Waters muſt circulate with Eaſe, becauſe they are able to enter the Body by ſome of the moſt minute Veſſels. There are many other Caſes wherein medicated Baths are proper, as in Scurvies, *&c.* But warm Bathing ſhould never be us'd in a Fit of the Gout, inward Inflamations, Dyſenteries, large inward Tumors, Vomiting or Purging of Blood, neither is it proper for ſanguine and plethoric People, nor yet for People of weak and lax Fibres.

Partial, warm Bathings are often of very great Benefit in ſome Diſtempers, eſpecially in Apoplexies and Small Pox; for by relaxing the inferior Parts, a greater Quantity of Blood will be deriv'd thither from the Head and ſuperior Limbs; whence a leſs Obſtruction, and leſs Degree of Inflammation. Moreover, ſome of the Water will be abſorb'd by the Veſſels, whence the Blood will be diluted, and be leſs inflam'd; for which Reaſon the Sick in the Small-Pox, inſtead of bathing their Feet only in warm Water, had better ſit in the Water quite up to the Waſte, at leaſt their Thighs ſhould be bath'd.

The Benefit of Friction.

§ 10. By Friction is meant, a reciprocal Preſſure and Laxation of the Part; From what has been already ſaid, we know the Circulation is perform'd, and the Viſcidity of the Blood broken, by the mutual Contraction and Dilatation of the Veſſels; and that by Rubbing, whether with the Fleſh-Bruſh, coarſe Flannel, or the naked Hand, we mutually compreſs and relax the external Veſſels, (which is the ſame Thing, as adding ſo much contractile Strength to them) is what, I believe, none will deny; and if we rub from the Extremities towards the Body, we very much accelerate the Circulation, by which many Advantages will accrue.

This was frequently put in Practice by all the Ancients in general, as well *Arabians* and *Ægyptians* as *Greeks* and *Romans*; *Galen* has wrote a whole Book *De Frictionibus*, as well as *Celſus* (*u*). This Practice among the Moderns was alſo quite laid aſide, and is now begun to be us'd again, and with no leſs Succeſs than formerly. I once ſaw a Child, that was born with one of its Legs much emaciated, the other being very luſty and ſtrong, as

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(*u*) Cap. 14. Lib. 2. pag. 87.

was the Child in all other Reſpects; this ſmall Limb by frequent Frictions with Flannels held in the Fumes of Myrrh and Benjamin did quite recover, and its Leg became as luſty and ſtrong as the other. I ſaw another Child about Five Years of Age, which could not ſtand, and it's Back was ſo weak, that it was almoſt doublefold, yet by uſing Frictions all over it, eſpecially on the Spina Dorſi, and by cold Bathing it quite recover'd: This Method ſeldom fails in the Rickets.

The beſt Time for Friction, for the Promotion of Perſpiration, *&c.* is in a Morning, when we riſe; for then all that Matter, which is digeſted enough for Perſpiration waits to be drawn out, and the Solids have no manner of Weight left upon them, except the neceſſary Fluids, by which they would be enabled to perform their Offices with more Eaſe and cur, and, as a Clock or Watch new l, the ſeveral Motions of the whole would go on with greater Re-

§ 11. All thoſe Sorts of Exerciſes, which give a Briſkneſs of Mind to that of the Body, are moſt beneficial, ſuch as Hunting, Fowling, Setting, Playing at Bowls, *&c.* but all ſuch Exerciſes as require too intenſe Thoughtfulneſs or Anxiety of Mind, in a great Meaſure take away the Benefit of the Bodily Exerciſe, as I ſhall ſhow more fully when I come to treat of the Affections of the Mind.

What Exerciſe is beſt.

I am not inſenſible, how difficult a Task it is to frame Arguments forcible enough to prevail againſt the Apprehenſions moſt ſickly People have conceiv'd of the Pain and Trouble that attend the firſt Attempt of Exerciſe, but ſuch People may begin with more or leſs, as they find their Strength will permit; the beſt general Rule is to deſiſt as ſoon as they find they begin to be fatigu'd, which at firſt will be very ſoon, but every Day they will bear it longer and longer, the more they follow it, for thereby they become daily ſtronger. This common

Obſervation ſhou'd convince us, that what Limb is moſt us'd, is ſtronger and larger than the other, as we often ſee in Reſpect to our Hands; and alſo how the ſeveral different Organs of labouring Men are ſtrengthen'd, as they happen to be moſt employ'd in their ſeveral Occupations, let them be otherwiſe ever ſo ſmall or weakly; thus the Legs, Thighs, and Feet of a Chairman; the Arms and Hands of Watermen and Sailors; the Backs and Shoulders of Porters grow thick, ſtrong and brawny in Time. 'Tis alſo certain, that loud Speaking, without over-ſtraining the Voice, will both ſtrengthen it and the Lungs. Our Nails and Hair, the more they are cut, the more they grow; and we may alſo promote any Evacuation ſo far as to ſtarve all the reſt.

CHAP. V.

On Sleeping and Waking.

The Benefit of Sleeping and Waking.

§ 1. AS all Animal Bodies, from the Action within them, as well as from the Rubs of Bodies without them, are conſtantly throwing off ſome of their ſuperfluous and decay'd Parts; ſo to reſtore this Decay and Waſting of Animal Bodies, Nature has wiſely made alternate Periods of Labour and Reſt, Sleeping and Waking, neceſſary to our Being; the one for the active Employments of Life, to provide for, and take in the Materials of our Nouriſhment; the other, to apply thoſe Materials to the proper Parts, and to ſupply their Expences.

In Sleep, all the Muſcles that are intended for voluntary Motion are, as it were, in a paralytic State; hence their

Effect ceaſes, as well as the Affections of the Mind. In this State, one wou'd be apt to think, that for Want of muſcular Motion, the Blood wou'd become viſcid and acrimonious; but Providence, to anſwer that Inconvenience, has appointed a ſtronger, deeper, and more regular Motion of the Lungs, Heart, Arteries, and Bowels; whence proceeds a ſtronger and more regular Circulation and Mixture of all the vital Humours; Nutrition and Secretions towards the Skin are increas'd, as are alſo thoſe of the Brain; whence a freſh Supply of Spirits for the next Day's Expence, as alſo for a Reſtitution of what was before borrow'd; hence a perfect Digeſtion and Excretion of the inſenſible Perſpiration, that which goes off in Sleep being moſt beneficial; becauſe during that Time, the Solids are in a State of Relaxation, and the Motions of the Fluids more regular; by which Means, nothing is thrown off by any of the Excretions by the Pores, but what is thoroughly digeſted and fitted to paſs off that way; and likewiſe, becauſe in this relax'd State of the Fibres in Sleep, that Secretion, which is made in the Brain, and by which the Nerves are ſupplied with what is neceſſary for their Invigorations, is perform'd. Whereas in Waking, the Vibrations of the Solids, upon which the Motions of the Fluids depend, are more irregular and diſturb'd, being ſubject to Alterations from abundance of Cauſes, even the Affections of the Mind, as we ſhall ſhow in it's proper Place; hence the Juices are more confus'd, and the Secretions not ſo perfect, becauſe, with what is digeſted and ſuited to paſs the Strainers, there will alſo often-times go off ſome Parts, which can't be ſpar'd without great Prejudice: Moreover the Solids being conſtantly ſtretch'd and employ'd, that Juice, which is abſolutely neceſſary for invigorating the Solids, is not divided to them in ſuch Proportion, as it is waſted; whence a continual Decay of Strength. Hence alſo we ſee the Reaſon, why *Sanctorius* (*a*) ſays, "Unequal Watchings "render the Body heavier and weaker."

§ 2. Who

(*a*) Aph. 53. § 4.

The Effects of too much Watching.

§ 2. Whoever conſiders the Neceſſities and Advantages above recited, will ſoon perceive, how too much Watching will defraud the Solids of that due Supply of the Spirits, which is abſolutely neceſſary to enable them, rightly to perform their ſeveral Functions; and therefore of Conſequence, for Want of a good Digeſtion, the Perſpiration being in Part obſtructed, the Body muſt grow heavier; hence *Sanctorius* (*b*) ſays, "Interrupted and unquiet Sleep leſſens the Quantity uſually thrown off by Perſpiration about $\frac{1}{3}$ Part." And alſo (*c*), "Whatſoever hinders Sleep, hinders alſo the Perſpiration of that digeſted Matter, which ought to exhale." We muſt always obſerve, that whatſoever hinders that eaſy Relaxation neceſſary for ſound Sleep, muſt hinder Perſpiration; hence a full Stomach muſt hinder it; becauſe during that additional Load, the Fibres are on the Stretch, therefore, until that be remov'd out of the Stomach, the Sleep will be inter-

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(*b*) Aph. 5. § 4.
(*c*) Aph. 8. § 4.

interrupted and diſturb'd. If any one, not labouring under any Diſeaſe, is diſturb'd in his Sleep, it muſt ariſe from ſome Sort of Crudities, which are undigeſted, and not carry'd off by proper Exerciſe; and the reſtleſs Nights, and the Difficulty of going to Sleep, which are generally aſcrib'd to the Vapours, are entirely owing to theſe Cauſes, tho' they be not ſo ſtrong, as to become ſenſible. Theſe Sort of People in particular, and indeed all in general, ſhou'd attend to that Aphoriſm of the *Schola Salernitana*, *viz. Somnus ut ſit levis, ſit tibi Cœna brevis.* *Sanctorius* alſo ſays (*d*), "They "who ſleep and do not dream, perſpire "well; and on the contrary, they who "dream much, perſpire leſs:" For Dreaming is a State between Waking and Sleeping, wherein, although the Mind does not exerciſe ſuch a Power over the Body, as to direct it's Motions in the ſame Degree as when awake; yet by it's Attention to thoſe confus'd Ideas which paſs thro' it, the Solids are kept in ſome Degree of Con-

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(*d*) Aph. 27. § 4.

Contraction, greater than is agreeable with ſound Sleep; and therefore Perſpiration, which depends upon a ſettled Relaxation, cannot ſo well be perform'd at ſuch Times, as when in quiet and ſound Sleep, neither are they ſo refreſh'd in the Morning. It is a certain Sign of Indigeſtion when they whoſe Sleep is diſturb'd have their Mouths and Faúces lin'd with a thick, viſcid Subſtance in the Morning, after Sleeping or Doſing.

The Effects of too much Sleep.

§ 3. On the other Hand, *Sanctorius* ſays (*e*), "By too much Sleep both the "inward and outward Parts grow cold, "the Humours are obſtructed and ren"der'd unperſpirable, and the whole "Body heavier." By thoſe very Means by which moderate Sleep does Service, too much of it proves injurious, becauſe too much Relaxation overcharges the Capillary Veſſels with too thick and too large a Quantity of Juice, which, inſtead of making them fitter for Motion, clogs them, and renders them leſs capable of reco-

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(*e*) Aph. 50. § 4.

recovering their Springs afterwards; and when once the Solids fail, the Fluids of courſe ſlacken in their Motions; hence they grow cool, and their Fluids become ſizy; they alſo then perſpire leſs, whence they become heavier: It is a true and common Obſervation, that after too much Sleep, the Head ſeems heavy, dull and drowſy.

The propereſt Time for ſleeping.

§ 4. The propereſt Time for Sleeping is about four Hours after Eating, as *Sanctorius* obſerves (*f*), becauſe then the Stomach is almoſt empty; and when the Chyle has got into the Blood, ſuch a quiet and relax'd State, as Sleep procures, is moſt conducive to Nutrition and Perſpiration: And the beſt Time is in the Night, becauſe the Damps, Vapours and Exhalations in the Day-time, which are ſo rarefy'd by the Heat and Action of the Sun, as to become innocent or very weak, are condens'd, and fall down to the Surface of the Earth in the Night-Seaſon, and conſequently muſt obſtruct

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(*f*) Aph. 28. § 4.

the Perſpiration: And I have alſo ſhewn before, that our Bodies ſuck in Particles floating in the Air, to avoid which Evils Nature ſeems to have appointed the Day for Labour and the Night for Reſt. People ſhould riſe early in the Morning, according to the old Proverb, *Diluculo ſurgere ſaluberrimum eſt*, (the Reaſon of which is plain from § 3. of this Chapter) but this is within proper Reſtriction, for no Perſon ought to go into the open Air before the Damps and Fogs are diſpers'd: Hence we may with *David* ſay, *Vanum eſt vobis ante lucem ſurgere*, Pſal. 127. Ver. 2.

§ 5. It often happens, that if a Perſon has not ſlept very well, he feels a Wearineſs in the Morning, which is beſt remov'd by Exerciſe; for that Wearineſs muſt have been occaſion'd by an Obſtruction of ſome indigeſted perſpirable Matter, which by Exerciſe may be broke ſmall enough to paſs the Pores.

§ 6. People of weak Conſtitutions ought to ſleep after Meals but a ſhort

Time, if at all, becauſe the Food will paſs the Lacteals, and get into the Blood, before it be broke fine enough to be afterwards digeſted by the weaker Attritions of the Veſſels, whereas a little moderate Exerciſe might perform a thorough Digeſtion of it, before it gets too far. But yet a little Sleep at ſuch Times may be proper, becauſe in it, the Perſpiration which goes off may compenſate for the Deficiencies of the laſt Night's, yet if it be too long continu'd, the fore-mention'd Evils will follow.

CHAP. VI.

On the Excreta & Retenta.

§ 1. I Am to ſhow in this Chapter the Conſequences of a Retention of what ſhould be excreted, and of a too great Excretion of what ſhould be retain'd; in treating of which I propoſe to ſhow the various Changes our Food undergoes by the many Actions of our Bodies upon it in all the three Stages of Digeſtion, and with what Humours it mixes in its Paſſage, quite from its firſt Entrance into our Bodies, to the Excretion of its various Parts out of the Body.

Digeſtion is divided into three Parts; the 1ſt Stage may be reckon'd from the Entrance of our Food into the Mouth, to the Entrance of the Chyle into the Lacteals. The 2d, from the Entrance of the Chyle into the Lacteals, to its Mixture with the Blood in the right Ventricle of the Heart. The 3d and laſt Part, is from its Expulſion with the Blood from the Heart thro' the Lungs, and thence quite thro' the whole Circulation of the Blood to the excretory Veſſels.

The Uſe of the Saliva.

Our ſolid Food, when taken into the Mouth, is there, by the Force of the Jaws, comminuted and mix'd with the Saliva and Mucus of the Fauces into a Sort of thick Emulſion or Pulp. This Saliva of an healthy Perſon is thin, and has little or no Taſte or Smell. It is ſaponaceous, as appears by its Frothing, and likewiſe by Diſtillation, and conſequently it is attenuating, reſolving, penetrating and detergent; it conſiſts of a Water, a Spirit in Plenty, but of little Oil or Salt; by long Faſting, it becomes extremely acrid. It's Uſe is to render our Food miſceable into a ſeeming Homogeneous Fluid; for as it is ſaponaceous, it is compos'd of oily and ſaline Particles, which are the very Things neceſſary to make Oil and Water in our Food miſceable; by this Means alſo it helps to diſſolve the viſcid Parts of our Food; it diſſolves the ſaline Parts of our Food by its aqueous Parts, which is the proper Menſtruum for Salts of all Kinds, it increaſes Fermentation in all aceſcent Vegetables by its Spirits. Hence we may know the Conſequence of too great Excretion of the Saliva, *viz.* a Decay of Appetite, a bad Digeſtion, a Thirſt, Atra-Bilis, and an Atrophy; theſe have been confirm'd by Experience in ſeveral, who have made it their conſtant Buſineſs to chew Maſtic, to chew or ſmoak Tobacco, or the like: Hence alſo we ſee wherein Smoaking is proper, *viz.* in Phlegmatic Conſtitutions. Phlegm is not ſecreted from the ſalivary Glands, but from other Glands and Veſſels of the Trachea and Lungs, which by the Suction in Smoaking, is brought up, and thereby the Glands and Veſſels are clear'd from their Burthen, whereby the Lungs can play with more Eaſe, the Neceſſity of

Too great Excretion of the Saliva.

of which the Reader already knows, and will ſee farther made appear, when I come to treat of the laſt Part of Digeſtion.

A Gentleman of this County, about Forty Years ago, was in a Conſumption, his Strength and Body daily waſted; he conſulted ſeveral Phyſicians at different Times, who gave him Stomachic and other Medicines proper for ſuch a Caſe, but all to no Purpoſe. At laſt he conſulted one, who advis'd him to ſmoak a Pipe every Morning faſting, and at going to Bed, but to ſwallow his Saliva and Phlegm, from which Time he recover'd, and is now alive; this Account I had from himſelf. This Phyſician muſt have had theſe two Intentions in View, *viz.* Firſt, As the Patient was troubl'd with a great Load of Phlegm, which clog'd up his Lungs; That was to be brought up, and by nothing better than the Suction in Smoaking. And, 2dly, As his Digeſtion was bad, it was not proper to ſpit out the Saliva, which would unavoidably be mix'd with the Phlegm, therefore he adviſ'd his Patient to ſwallow both together. If other Smoakers did the ſame, the Practice would not be altogether ſo bad for many of them as it is. Chewing Tobacco can anſwer no good End, ſince it only clears the Fauces, which any Thing elſe might better do, becauſe it might be ſwallow'd, and then they would reap the Benefit of the Saliva and Chewing too.

People of weak Nerves and Paralytics have frequently a very great Diſcharge of Rheum from the Glands of the Throat, and Stomach, which is by ſome call'd a Nervous or Scorbutic Spitting. Hypochondriacs are often more or leſs troubl'd with it, eſpecially after Eating ; and the Difficulty of the Cure of all the Diſeaſes of weak Nerves, depends much on the Quantity and Conſtitution of this Flux. For much and long Spitting or Running out of this Rheum, implies a great Relaxation of the whole nervous Syſtem, and ſhows none of the Concoctions have been duly perform'd.

If the Saliva be not ſecreted in a ſufficient Quantity, the Deglutition and Digeſtion will in ſuch Proportion be impar'd, and bring on Thirſt, Crudities, Cachexies, *&c.* It is a laudable Juice ſecreted immediately from the Arterious Blood; it is ſuppos'd that one, who eats a Pound of Bread, ſwallows as much Spittle: Hence we may gather the Conſequence of a vitiated State of Blood, for the Saliva muſt be the ſame, and will infect the Chyle, and offend the Stomach: I don't diſpute but that the Pain which ſome Perſons have in the Stomach when empty, proceeds from this Cauſe. The Secretion of the Saliva is promoted by the Motion of the Jaws, by Suction and by Diluents; hence a Depravation of the Inſtruments of Maſtication by a Paralitical Diſorder, indicates a thin Diet, as of Milk or Broth; hence alſo, as People in old Age have weaker Digeſtions, and chew leſs, they ſhould live upon the ſame Diet, they ſhould alſo move their Jaws pretty much, to promote a Diſcharge of

Too little Secretion of Saliva.

Quantity of Saliva.

Its Secretion how promoted.

of the Saliva, though they ſhould live upon a liquid Diet.

Mucus. The Mucus which mixes with the Saliva and Food in Maſtication, is ſoft and lubricating, it is ſecreted from the Glands, and abounds with a great Quantity of Air, which, when intimately mix'd with our Food, helps to diſſolve the Aliment.

The Food being thus comminuted and intimately mix'd with our Saliva, is ſwallow'd down; in its Paſſage thro' the Oeſophagus it takes along with it ſome of the Mucus which is ſecreted by the Glands and Veſſels of the Oeſophagus; this Mucus is of the ſame Nature as that of the Fauces. The Uſe of this Mucus is to ſoften and lubricate the Fibres, and to preſerve 'em; hence a Hoarſeneſs is caus'd, only by the Cold ſhutting up the Mouths of the Glands and Veſſels. Our Food is no ſooner got into the Stomach, but it begins either to ferment or putrefy, according to the Nature of the Aliment (but never would arrive either at a perfect Fermentation or Putrefaction)

faction) and is there, partly by the Heat, Force and Action of the Stomach and Liquors contain'd in it, chang'd into either an aceſcent, alcaleſcent, rancid, or glutinous Maſs; which is yet farther diluted by a conſtant Secretion of a thin Humour from the Arteries of the Tunica Villoſa (*a*), and Glands of the Vaſcular Coat of the Stomach (*b*), all which, with the Liquor that is drank down, are macerated, attenuated, diſſolv'd, and mix'd into a Kind of whitiſh, grey-colour'd Subſtance, like to an Emulſion. This Liquor, which is ſecreted in the Stomach coming immediately from the Arterious Blood, muſt partake of whatever Diſorders are there; hence very often Nauſeas and Vomitings when there is no Load in the Stomach; hence alſo Pains, Heart-burnings, *&c.*

This Liquor of the Stomach may (by Reaſon of the Acrimony) acquire ſome determin'd Quality, and affect human Creatures

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(*a*) *Willis*'s Pharm. Ration. § 1. Cap. 2. *Hales*'s Hæmaſt. pag. 121. § 13. Exper. 14.

(*b*) Moagag. Adverſar. 3, 6.

Creatures with Appetites for unuſual Things, which can't be taken without Hurt; or it may occaſion an exorbitant Appetite of uſual Things, which they will take in ſuch Quantities, 'till they vomit them up like a Dog, from whence it is call'd Canine; in the firſt Caſe, the Organs of Taſte are vitiated; both Diſeaſes are cur'd by Diet, oppoſite to the Acrimony.

Such as have, by the Uſe of Spirituous Liquors, or any other Means weaken'd and deſtroy'd ſome of the ſolid Parts of the Stomach, can neither recover a good Appetite, nor right Digeſtion, for the inward, villous Coat, when deſtroy'd, can't be reſtor'd again.

The Contents of the Stomach are protruded thence into the Inteſtines, here it immediately mixes with the Cyſtic Bile, which comes out of the Gall-Bladder (*c*), and with the Hepatic Bile, or that which

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(*c*) Gliſſon de Hepat. Cap. 37.

which comes immediately from the Liver, and alſo with the Pancreatic Juice.

Cyſtic Bile.

The Cyſtic Bile is of a deep, yellow Colour, is the bittereſt Humour in the Body, of the Conſiſtence of a thin Syrup, only flows into the Inteſtines when the Gall-Bladder is compreſs'd by the full Stomach, it is neither alcali nor acid, but is very alcaleſcent, and in a few Hours becomes a perfect Alcali; there is no other bitter Humour in the Body, except the Wax in the Ear. The Bile is a ſaponaceous Body, being compos'd of an Oil (*d*) and alcaline Salt, and Spirit diluted with Water, is not combuſtible, unleſs firſt dried by the Fire; it is a Sort of Liquid Soap, its Uſe is to render oleous, gummous and reſinous Subſtances miſceable with Water; hence ſome uſe it to take Spots out of Woollen or Silks, and Painters uſe it to mix their Colours withal; it is the moſt powerful Diſſolvent yet known. The Milk in the Stomach of Calves, which is coagulated by

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(*d*) Homberg. Act. Reg. ſcient. 1708.

by the Runnet, is again diſſolv'd and render'd fluid by the Gall in the Duodenum. Voraceous Animals which don't chew, have a great Quantity of Gall, and ſome of 'em have the Biliary Duct inſerted into the Pylorus. The Gall of an Eel is moſt intenſely bitter, and one of the moſt powerful Diſſolvents. The Gall abſterges whatever glutinous Matter may clog and ſtuff up the Mouths of the Lacteals, ſo much as to hinder the Entrance of the Chyle into 'em. Hence we ſee that too great Excretion of the Bile will hinder the Chylopoieſis, will hinder the Concoction of our Food, the Secretions and Excretions, and bring on an acid State. By abſterging that Mucus which guards the Veſſels and Nerves of the Inteſtines, it cauſes bilious Cholics, Diarrhæas, Vomitings, Weakneſs, Paleneſs, and Leucophlegmatias, but if it can't be ſecreted in a ſufficient Quantity, it cauſes a Jaundice, Indigeſtion, a Loſs of Appetite, white, hard Fæces, a lixivial Urine, and the Chyle will be unequally mix'd, the Oils, Salts and Spirits will not unite into a ſeeming homogeneous Body;

Too great Excretion of the Bile.

Body, and the Mouths of the Lacteals will be obſtructed with a viſcid Chyle; whence an Atrophy will enſue.

Hepatic Bile.

The Hepatic Bile is more diluted, more pellucid, whiter, and not ſo bitter as the Cyſtic Bile; and almoſt conſtantly flows into the Inteſtines, but is weaker than the Cyſtic Bile, tho' it abounds with the ſame Virtues.

Pancreatic Juice.

The Bile is ſo acrid, that alone it could not be admitted into the Lacteal Veſſels; therefore Nature has appointed another Humour, *viz.* the Pancreatic Juice to temper its Bitterneſs and Acrimony, after it has done its Office. It is ſecreted from a large, conglomerate Gland (*e*), it taſtes a little ſaltiſh, is liquid, and is continually flowing in about the Quantity of a Pound in 12 Hours. It is neither acid nor alcaline; but comes the neareſt to the Nature of the Saliva of any Humour in the Body. By its diluting the Bile, it mixes it the more intimately with the Chyle:

(*e*) Wharton. Adenograph. Cap. 13. De Graaf de Succ. Pancreatic.

Its too great Excretion.

Chyle: Hence we ſee that too great an Excretion of it has much the ſame Effect, as too great an Excretion of the Saliva. Hence alſo proceed Diarrheæ Seroſæ, Weakneſs, Faintneſs, Thirſts and Hectics:

Its too great Suppreſſion.

But if it is either totally or in Part ſuppreſs'd, then the Chyle will be too viſcid, *&c.* cauſing Gripings, Tumors of the Abdomen, *&c.* We ſee all theſe Fluids dilute, reſolve and make the Chyle one ſeeming homogeneous Subſtance, which is, by the Action and periſtaltic Motion of the Inteſtines, ſqueez'd into the Mouths of the Lacteals; the more vigorous this Action of the Inteſtines is, the greater Quantity is ſent into the Lacteals, for the Excrements of ſuch People are always thick and hard; but on the other Hand, they who have weak and lax Inteſtines, have thin Fæces. Hence we ſee, that an aſtringent Diet, and all Cauſes of a preternatural Retention in the Guts, will forward the Protruſion of a groſſer Chyle into the Lacteals, and *vice verſa.* Hence alſo we ſee that they, who have their Viſcera ſtrong and robuſt, ought alſo to have their ſecond and third digeſtive

Organs ſound and good, elſe the Blood would be ſoon fill'd with indigeſted Humours. Hence alſo we ſee, if the Mouths of the Lacteals are either in Part or totally obſtructed by any Mucus, too viſcid Chyle, or the like, an Atrophy muſt enſue: This is one Cauſe of Conſumption, which every one does not think on, and which is often the Caſe with young Children, ſome of whom have very tumid, hard Bellies. In a natural State we ſhould go to Stool once a Day, and the Fœces ſhould be of a due Conſiſtence between the two Extremes: *Oportet ſanorum ſedes eſſe figuratas.*

The moſt ſubtle Parts of the Chyle paſs immediately into the Blood, merely by the abſorbing Veſſels of the Stomach and Inteſtines, which diſcharge their Contents into the meſeraic Veins, whoſe Largeneſs and Number ſeem to demonſtrate as much; but Mr. *Hales*'s Experiment has put this paſt Diſpute; and there are ſeveral Things, which quickly give a Flavour and Taſte to the Urine, which they could not do ſo ſoon, if they went the

Circulation both of the Chyle and Blood *(f)*: Beſides, wherever there are Emiſſaries, there are abſorbent Veſſels, as far as we yet know. If one conſiders the Straitneſs of the Thoracic Duct, and the Slowneſs of the Paſſage of the Aliment thro' the Lacteals to it, and at the ſame Time the great Quantity of ſome Liquors, which paſs by Urine in a very ſmall Time, by an eaſy Calculation he will be able to demonſtrate, that ſuch a Quantity could not paſs into the Blood by the Thoracic Duct in ſo ſhort a Time. Hence when immediate Refreſhment is requir'd, thin and liquid Aliments are moſt proper; and for the ſame Reaſon, Chalybeat Waters ſeem to be a proper Remedy in Hypochondriac Caſes, and in almoſt all Kinds of Obſtructions in the Meſenteric Glands, Liver and Spleen; becauſe their moſt ſubtle Parts are taken up by the Meſeraic Veins. Hence alſo we ſee a Reaſon, why People in Pulmonic Conſumptions ſhould always be fed with Spoon Meat, by which the Lungs may

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(f) Hæmaſt. pag. 123. § 16. Exp. 14.

may be eas'd without over-ſtraining the Veſſels.

§ 2. The Second Part of Digeſtion is from the Entrance of the Chyle into the Lacteals, to its Mixture with the Blood in the right Ventricle of the Heart.

The 2d Part of Digeſtion.

The Lacteals have ſemilunar Valves (*g*) to prevent the Return of the Chyle into the Inteſtines. The Lacteals at their firſt Beginning at the Inteſtines are many and ſmall (*h*); in their Progreſs in the Meſentery they unite, and become fewer in Number, tho' of a larger Capacity; they are again divided into a greater Number, but of a leſs Capacity. In this Mechaniſm, Providence ſeems to have been particularly careful to break the Viſcidity of the Chyle, for by uniting the Veſſels, and dividing or ſeparating 'em again, the viſcous Part of the Chyle will be more broken and attenuated, than if it circulated in one, and the ſame continu'd

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(*g*) Vid. Ruyſch de Valv. Lact. pag. 11. Fig. 3, litur. B. B. b. b. Fig. 4. lit. a. a. Nuck. Adenogr, Fig. 22, 23, 24, 25.

(*h*) Nuck. Adenog. Fig. 9. lit. d, e, c, g.

tinu'd Tube. Theſe Lacteals, after they have again been divided, are variouſly diſpers'd, and as variouſly ſurround and enter the Meſenteric Glands (*i*); here the Chyle is again further diluted by a thin Lympha ſecreted immediately from the Blood. Hence we ſee the Conſequences either of an Obſtruction in theſe Glands, or of their being ſkirrous ſo as to hinder the ſufficient Supply of the thin Lymph to dilute the Chyle, which is the Caſe in Hypochondriac and Hyſteric Diſorders, and of hard Drinkers, eſpecially of auſtere Wines, *&c.* as appears from Diſſections of ſuch, as *Bonetus* ſhows us (*k*). From the Meſenteric Glands, the Lacteals are fewer in Number, but much larger, they at laſt end in one common Receptacle, call'd the *Receptaculum Chyli*, into which all the Lymphatics diſcharge their Contents, and by which the Chyle is ſtill more diluted: This Lymph is compos'd of a Water, Spirit, and a very ſubtle Salt.

(*i*) Nuck. Adenog. Fig. 9. lit. E. Ruyſch. Th. 10. No. 61. and in his Tables, annex'd to his Epiſt. to *Boerhaave* de Glandulis.

(*k*) Sepulcr. Anatom. Tom. 2. Lib. 3. § 16. a pag. 279 ad 315.

Salt. Hence we ſee the Conſequence of an Obſtruction in the Lymphatics, *viz.* a thick viſcid Chyle, which might be in Danger of obſtructing, and an Anaſarca, for want of a Separation of the Lymph. From the *Receptaculum Chyli*, this Liquor aſcends thro' the thoracic Duct, (which is prevented from returning back, by Valves in the (*l*) Duct;) and is thence diſcharg'd into the Blood in the ſubclavian Vein, and therewith deſcends into the right Ventricle of the Heart, where it is but imperfectly mix'd; in it's Paſſage it receives the Lympha from all the upper Parts of the Body.

The Chyle in the Thoracic Duct is moſtly ſaltiſh, and partakes of that Taſte and Flavour which was moſt predominant in the Aliment.

The Mechaniſm of Nature, in converting our Aliment into Animal Subſtances, conſiſts chiefly in two Things: Firſt, In mixing conſtantly with it Animal Juices

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(*l*) Ruyſch de Valv. pag. 11. Fig. 5. lit. a, a.

already prepar'd. Secondly, In the Action of the ſolid Parts, as it were churning them together. This is evident if we conſider the Quantity of Saliva that is mix'd with the Aliment in the Mouth, the Liquor of the Stomach, the Bile, and Pancreatic Juice, the Quantity of the Lymph from the Meſenteric Glands, and the Quantity of the Lymph from the Lymphatic Veſſels of the whole Body: So that the Juices of an Animal Body are as it were cohobated, being excreted out of their reſpective Glands and Veſſels, and being again admitted into the Blood with the freſh Chyle: All this Time the Solids act upon the Mixture of Chyle and Animal Juices, ſo as to make the Mixture more intimate and compleat; ſo that, I think, we may ſafely ſay, that our Aliment before it gets into the Lungs, is mix'd with four times the Quantity of Animal Juices. Hence it follows, that an Animal, whoſe Juices are unſound, or the ſolid Parts weak, can never be duly nouriſh'd, for unſound Juices can never duly repair the Fluids and Solids of an Animal Body, and without a due Action of the ſolid Parts, they can never be well mix'd. Beſides, as the Chyle is not ſuck'd, but ſqueez'd into the Mouths of the Lacteals by the Action of the Fibres of the Guts, it is plain that it muſt be peccant in Quantity or Quality, when theſe Actions and Organs are too weak, and whatever ſtrengthens the Solids, muſt help the Digeſtion. Hence alſo it appears, that Diarrhæas and ſtrong Purgations muſt ſpoil the firſt Digeſtion, becauſe of the great Quantities of Animal Liquids which are thereby expell'd the Body, *viz.* the Saliva, Mucus of all the Viſcera, all the Liquors that are ſeparated in the Glands of the Alimentary Duct, both Sorts of the Bile, the Pancreatic Juice, Lymph, and ſometimes Blood: Computing the Quantity of theſe Secretions, makes it plain that almoſt the whole Juices may be carried off by Purging; and when theſe Liquors are expell'd out of the Body, which by their Mixture convert the Aliment into an Animal Liquid, the Digeſtion cannot ſo well be perform'd. Hence alſo we ſee in tabid Perſons, Milk is the beſt Reſtorative, that being Chyle already prepar'd.

The laſt Part of Digeſtion.

§ 3. The Chyle, we obſerv'd, mix'd with the Blood at the Subclavian Vein, and with it, enter'd the right Ventricle of the Heart, where they are mix'd a little; from hence they are propell'd into the Lungs, which are the firſt and chief Inſtrument of Sanguification. The Wind-Pipe is divided into a great Number of Branches, call'd Bronchia; theſe end in ſmall Air-Bladders dilatable and contractile, which are capable to be inflated by the Admiſſion of Air, and which ſubſide at the Expulſion of it. The Pulmonary Arteries and Veins paſs along the Surfaces of theſe Air-Bladders in an infinite Number of Ramifications (*m*) like a Net-work (*n*). A great Number of theſe Air-Bladders form what we call Lobuli, and theſe Lobuli conſtitute the Lobes of the Lungs: Theſe Air-Bladders, or Lobes, always ſink in Water before they have been inflated, but after once Air has enter'd them, they will always

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(*m*) Ruyſch. Theſaur. 3. No. 24.
(*n*) Malphig. de Pulm. Epiſt. 1. 2. Tab. 1. Fig. 1, 2, 3.

always ſwim: Hence we ſee how to know whether Children be born alive or dead.

The crude Mixture of the Blood and Chyle, being propell'd from the right Ventricle of the Heart, paſſes through all the Ramifications of the Pulmonary Artery, and the more Ramifications there are, the more perfect the Mixture will be; but this is not all, for as this Mixture of Blood and Chyle paſſeth through the Branches of the Artery, it is preſs'd by two contrary Forces, *viz.* that of the Heart driving it forward againſt the Sides of the Tubes, and the elaſtic Force of the Air preſſing it on the oppoſite Side of thoſe Air-Bladders, along the Surface of which theſe Veſſels creep. By theſe two oppoſite Forces, the Liquor is more intimately mix'd and compreſs'd, and by the alternate Ingreſs and Egreſs of the Air, the Veſſels are alternately compreſs'd and relax'd, which is ſtill better than if it was one continu'd compreſſing Force. By this moſt ſurpriſing Mechaniſm, the Liquor is ſtill more attenuated, diſſolv'd and mix'd, and is almoſt aſſimulated with the Blood; I ſay almoſt, becauſe it is well known from Experiments by Venæſection, that ſometimes eight Hours after Eating, ſome of the Chyle has been diſcover'd ſwimming at the Top of the Blood, like an oily Subſtance.

This Faculty of attenuating, and breaking the Viſcidity of this Mixture, which we will now call Blood, is, *cæteris paribus*, moſt vigorous in ſtrong Conſtitutions, and *vice verſa*. Hence we ſee that the Action of the Lungs is of greater Conſequence than any of the other Viſcera, for no Part of the Body receives any Arterious Blood 'till it has firſt circulated thro' the Lungs. Hence alſo we ſee, that as much Blood goes thro' the Lungs in the ſame Space of Time, as thro' all the reſt of the Body; and from whence here is the greateſt Heat, and thence ariſes the Neceſſity of the Air to cool 'em. Their Texture is ſo very delicate, that they are extremely ſenſible of any Force, either from a too violent Motion, or Acrimony of the Blood. We ſee alſo that they are the firſt, and chief Organ of Sanguification; the Perſon therefore who has that Organ faulty, can never be duly nouriſhed, eſpecially if the Lungs are any way ulcerated or corrupted: Hence ſuch People ought to eat but little at a Time, becauſe the great Increaſe of the Quantity of freſh Chyle, muſt make that Circulation ſtill more uneaſy, which is the very Caſe with conſumptive and aſthmatic Perſons, and alſo accounts for the Symptoms they are afflicted withal after Eating. It happens often very unlucky for aſthmatic People, that they have voracious Appetites, and conſequently, for Want of a perfect Sanguification, are often leucophlegmatic. It is to be obſerv'd, that the Defects of the firſt Concoction, are not to be mended by the ſecond, for if the Chyle paſſeth into the Blood in ſo bad a State, that the Force of the Fibres, which contribute to the ſecond Concoction, can't ſufficiently comminute it, then there muſt of courſe follow various Kinds of Obſtructions.

From the Pulmonary Arteries, the Blood is drove into the left Ventricle of the Heart, and is thence, by the Force of the Heart, drove into the Aorta quite through the whole Body.

The Arteries are endued with a contractile Force, by which they ſqueeze and drive the Blood ſtill forward, it being hinder'd from going backward by the Valves of the Heart. The Arteries are Conical Tubes, with their Baſes towards the Heart, and as they paſs on, their Diameters grow ſtill leſs and leſs, the Benefit of which I have already mention'd in § 2. Chap. 1. of Exerciſe. This Fluid being compreſs'd by the Sides of the Tube, eſpecially in the ſmall Veſſels, where the Points of Contact are more, is ſtill more intimately mix'd: Hence appears the Neceſſity of Exerciſe to promote a good Digeſtion.

The Blood in live Animals in its natural State, is neither acid nor alcaline, is a little ſaltiſh, and conſiſts of a Water, Salt, Oil and Earth, and is compos'd of red Globules, ſwimming in a Serum or watery Liquor. The ſmalleſt Veſſels, which carry the Blood by lateral Branches, ſeparate the next thinner Fluid or Serum, the Diameters of which lateral Branches are leſs than the Diameters of the Blood Veſſels, and will not in an healthy State admit the red Fluid. Theſe may be call'd Serous Arteries, they alſo emit lateral Branches, which carry a Lymph, ſtill more limpid than Serum, and from that Liquor are call'd Lymphatic Arteries; and theſe will not admit Serum. How far this Progreſſion goes is not certain, ten Capillary Arteries in ſome Parts of the Body, as in the Brain, are not equal to one Hair, and the ſmalleſt Lymphatic Veſſels are many times ſmaller, than the ſmalleſt Capillary Artery. Hence one may eaſily perceive the Inconvenience of Viſcidity, which obſtructs, and Acrimony, which deſtroys the Capillary Veſſels.

Lewenhoeck ſays, he diſcover'd, that the red Globules of the Blood were compos'd of ſix Globes of the Serum. Hence the Redneſs,

Redneſs and Solidity of the Blood is caus'd by the Strength and Elaſticity of the Heart and Veſſels: The Proportion betwixt the red and ſerous Parts of the Blood are different, according to the Time of Venæſection, and the Diſeaſes of People. It is call'd good Blood, when the Globular Part is of a moderate Cohæſion and Firmneſs of Parts, in a pretty near equal Proportion to it's Serum, and of a red, ſcarlet Colour: The Serum ſhould be about the Conſiſtence of Water, pretty clear, and almoſt inſipid, at leaſt not biting ſaltiſh: But it is call'd rich Blood (which nevertheleſs is none of the beſt) when the Globular Parts are in a far greater Proportion than the Serum, more thick and denſe, and when the Serum is of a yellowiſh, tawny Caſt.

§ 4. What cannot be broke fine enough by the Force of the Arteries for further Secretions, either obſtructs in ſome of the Glands and ſmall Capillary Veſſels, or is ſtrain'd off by the Kidnies, and ejected by the Urinary Veſſels. Hence we ſee the ſtronger the Heart and Arteries are, the more is ſent forward into the minuter Paſſages; and the weaker they are, the greater Quantities are let fall thro' the Urinary Out-lets; whence ſtrong People make leſs Urine than weak: Preternatural Cauſes will occaſion a Deviation from this general Rule. We muſt obſerve, that the Faults of a too great Reſtriction of the proper Evacuation *per Anum*, are very naturally and providentially amended by this; becauſe the too groſs Particles, which by that Means were drove into the Blood, make their Exit by the Kidnies. A Reſtriction of the Urinary Paſſages ſend forward a great Quantity of groſs Parts, which obſtruct in the Glands and Viſcera, as their particular Properties, and the Textures of the Veſſels diſpoſe 'em. If the Urine be ſuppreſs'd, by putrefying, diſtending, and corroding, it deſtroys the Bladder, Ureters, Pelvis, and Kidnies; by being kept in the Blood it deſtroys the ſmall Veſſels of the Brain, whence Pains in the Head, Vertigo's, Apoplexies, and Death, ſeveral Inſtances of

Urine ſup-preſs'd.

of which we find in *Bonetus* (*o*). If there be too great an Excretion of Urine, from what Cauſe ſoever, by taking away the watery Parts of the Blood, it will cauſe an Immiſceablity of the Humours, a Heat, an inquenchable Thirſt, Crudities, and many ſuch Evils; and by carrying out the moſt nutritious Parts, brings an Atrophy and Death. The Urine is compos'd of a Water, a very ſubtile, volatile, acrid Salt, a fine, acrid, thin, volatile Oil, that ſoon putrefies, and of a very fine Earth, and a Spirit. The Salt is ſaponaceous, and is ſomewhat of a peculiar Nature, is neither Acid, Alcaline, Muriatic, nor yet like Sal Ammoniac, but will make Phoſphorus. The Oil ſeems to be compos'd of the very fineſt Parts of the Fat. The Urine differs both in Smell, Taſte, Colour and Quantity, according to the various Ages, Temperaments, Sexes, Seaſons of the Year, Alterations in the Non-naturals, and Difference of Medicines. But that of an healthy Perſon, which is no ways diſcolour'd

Too great Excretion.

(*o*) Sepulcret. Anatom. Vol. 2. a pag. 605 ad 641.

colour'd either by the Quantity or Quality of the Food, and is of a bright Amber Colour, of about three Quarters of the Liquor that is drank, and has a light Cloud hanging in it, is good Urine: for it is a certain Sign of a due Concoction, and of a juſt Proportion of Food.

§ 6. Thus we ſee, all that is taken into our Bodies does paſs thro' theſe three different Stages before it be diſcharg'd out, unleſs it be what runs off by the firſt and ſecond Emunctories: And becauſe what gets into the third Stage is of much the greater Quantity of what is taken in, as both *Sanctorius* (p) and *Keil* (q) have demonſtrated; as, I ſay, what gets into the third Stage is of much the greater Quantity, ſo it is of the utmoſt Importance to know how the Affairs of the Œconomy are conducted therein. The Diſorders of the firſt go not beyond the Stomach and Inteſtines, and lies ſo near the immediate Reach of Medicine, as to admit of ſome Certainty in Cure. Thoſe

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(p) Medicin. Static. Aph. 6. § 1.
(q) Medic. Stat. Brit. Aph. 4, 5, 6, 7.

of the Second, becauſe they are ſomewhat more remote, require more Art and Application to be come at; and beſides the Aſſiſtances of Medicine, admit of great Influences, from Motion, Concuſſion, and ſuch like Means. But in the third and laſt Stage, it requires the utmoſt Skill to ſend a Medicine with any tolerable Certainty of good Effect, it being liable to be alter'd by many Cauſes, before it gets ſo far. Here external Applications are to take Place, and great Things have been done by 'em; ſuch as various Kinds of Exerciſes, Frictions, Baths, and the like: For all theſe Things help to promote the greateſt of Secretions and Excretions, *viz.* that of Perſpiration. This, both as to its Matter and Quantity, is ſo abſolutely neceſſary to the Well-being of an Human Body, that a Diſeaſe can neither be remov'd, or Health preſerv'd, unleſs it be rightly digeſted and diſcharg'd. It ought therefore to be the utmoſt Concern to a Phyſician, not only perfectly to acquaint himſelf with the Nature of this Evacuation, but likewiſe thoroughly to know, by what Means it may

The Neceſſity of underſtanding the Nature and Uſe of the perſpirable Matter.

may be promoted, according to the ſeveral Exigencies of the Patient; either for the Preſervation, or the Recovery of his Health. We ought to have Regard to this ſort of Diſcharge above others, becauſe this can ſupply the Defect of other Evacuations better than any other can ſupply the Defect of this; and alſo becauſe it is promoted by Veſſels, which are by all allowed to be the grand Emunctories of the Body, as well thoſe of the Lungs and Bowels from the Mouth quite to the Anus, as thoſe of the Skin; as both *Sanctorius* and *Keil* have above demonſtrated.

Perſpirable Matter what, and how ſecreted; and alſo Sweat, what, and how ſecreted or excreted.

§ 7. Perſpirable Matter is that thin, volatile, ſaltiſh Vapour, which after a long Courſe of Circulations in all the Shapes of the Animal Fluids, is diveſted of all that can be of farther Uſe to any Part of the Body. This is ſecreted by the cutaneous Arteries, and paſſes off inſenſibly and almoſt inviſibly thro' the Pores of the Skin. The ſtronger and more elaſtic the Arteries are, the finer the perſpirable Matter is: But if theſe Arteries are either too much relax'd, or if the Blood circulate too freely and quick, then there will be a greater Quantity evacuated, of a thicker Conſiſtence, and ſupply'd more immediately from the Blood, and comes from its moſt nutritious Parts, which being ſenſible is commonly call'd *Sweat*. There is another Kind of Sweat, which is ſecreted from the miliary Glands and Follicles of the Skin, mention'd by that excellent Anatomiſt *Ruyſch* (*r*), and this is what is properly call'd *Sweat*. It is to be obſerv'd that the more a Man perſpires, the leſs he ſweats; becauſe the former depends upon a hardy, elaſtic State, the latter upon a relax'd State of the Fibres. The real Quantity carried off by Perſpiration can never be known by Ponderation; for as it is plain, that the outward Air, or at leaſt ſome of its Contents does enter the abſorbing Veſſels, the Quantity of perſpirable Matter found by weighing, is only the Difference of the Exceſs of that, beyond the Quantity of what was imbib'd. That

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(*r*) Adverſar. Anatom. I. pag. 10, 11, 12.

That which goes off in Sleep is beſt, becauſe, during that Time, the Solids are in a State of Relaxation, and the Motion of the Fluids more regular, by which means, nothing is thrown off by the Pores, but what is thoroughly digeſted and fitted to paſs that Way.

If ſtop'd in one Part, either is promoted in another, or a Diſeaſe enſues.

§ 8. Nature has ſo provided, that if by any external Cauſe, this neceſſary Evacuation is hinder'd in any one Part, it is always increas'd in another, or elſe a Diſtemper will enſue. For which Reaſon, when the Coldneſs of the external Air, or any Thing elſe leſſens the inſenſible Perſpiration of the Skin, either the ſenſible Evacuations are increas'd, as commonly the Urine, or greater Quantities are carried off by the Pores of the Lungs and Fauces, as we ſee in Froſty Weather, like Smoak out of the Mouth; or elſe it is perſpir'd into the Cavities of the Stomach and Guts, which is diſcharg'd by breaking Wind upwards or downwards, or by a Looſeneſs, or by the Salivary Glands: Some of theſe commonly happen to Hypochondriac and Hyſteric People, eſpecially when the Stomach is empty. Hence Cholics, Gripings, Pains in the Stomach, *&c.* All which are beſt cur'd by Exerciſe, for *ſublata cauſa tollitur effectus.* They who are ſubject to theſe Sort of Gripings, Cholics, *&c.* are, when free from 'em, very apt to have cutaneous Puſtles and Eruptions, eſpecially in the Face. If Perſpiration happen to ſtop in the Limbs, it there cauſes Rheumatic and Scorbutic Pains.

An Obſtruction of this can't be compenſated by increaſing any of the ſenſible Evacuations.

§ 9. It ceaſes to be a Wonder, that the Body becomes ſo much diſorder'd by a total or partial Obſtruction or Suppreſſion of the Perſpiration, more than by any Obſtruction of the ſenſible Evacuations: For there is ſo great a Difference between the Matter of this, and that of the ſenſible Diſcharges, that the leſſening one, will not be compenſated for, by increaſing the other, unleſs in very freſh Indiſpoſitions: For it will be very difficult to prevent Injuries, which may ariſe from what ought to paſs thro' the cutaneous Pores, if it be ſtop'd in the cutaneous Ducts, or be prevented from getting into 'em, by enlarging the other Evacuations: Becauſe, by its ſtaying in the Blood, there will be made ſuch Alterations, as can't eaſily be remedied by ſimple Evacuation: Hence we ſee moderate Exerciſe, and a temperate Uſe of the Non-naturals, may much more eaſily obtain the End wiſh'd for, than the Virtues of the moſt celebrated Medicines.

The Effects of a diminiſh'd Perſpiration.

§ 10. The Diminution of Perſpiration can't but add to the Weight of the Body, in Proportion to the Quantity detain'd, unleſs ſome other Evacuation be increas'd beyond what is natural. Whereſoever there is an increas'd Quantity of Fluids, the Reſiſtances to the contractile Force of the Arteries muſt be greater; and therefore if they are not ſupplied with a proportional Encreaſe of Spirits to enforce their Vibrations, they can't beat ſo frequently, nor ſo vigorouſly, whereby the Blood will flow ſlower. And as their Fluidities or Degrees of Conſiſtence are in Proportion to the Celerities (if not to too great a Degree) the ſlower they circulate, the thicker and more viſcid they grow, and conſequently obſtruct in the Capillaries, in the Viſcera, and bring on all ſuch Diſorders as belong to a Cachexy, ſuch as a Jaundice, Scurvy, Rheumatiſm, *&c.*

But if the Arteries are ſtrong enough to have their Vibrations or Contractions increas'd, then there will ſucceed a Fever, for an Obſtruction of Perſpiration increaſes the Quantity of the Blood; this Increaſe will alſo increaſe its Preſſure againſt the Sides of the Arteries; hence a ſtronger Pulſe, and alſo an Increaſe of the fluid Secretions, in Proportion greater than the thicker, as *Cheyne* and *Wainwright* have demonſtrated (*s*); hence a greater Secretion of Animal Spirits, whence a ſtronger Vibration of the Solids and a Fever.

The Effects of too great an Evacuation.

§ 11. Too great a Waſte of perſpirable Matter in a certain Time, can't but leave the Fibres too ſmall a Share of Moiſture and weaken them. Moreover the freſh, indigeſted

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(*s*) Propoſ. 18. of Animal Secretion.

indigeſted Humours will then preſs forward into the ſmall cutaneous Veſſels, and will there be apt to obſtruct; hence cutaneous Eruptions, *&c.* whence we may conclude, that after long Diſtempers, which have waſted much of the Subſtance of the Body, 'till that Loſs is repair'd, we ought to live with Temperance, to feed ſparingly, and of what is eaſy to digeſt. We ſhould alſo obſerve the ſame after long Faſting, or after any violent Exerciſe, or in travelling from a hot to a cold Climate.

It's Supply cut off by an Increaſe of the ſenſible Evacuations.

§ 12. It is certainly true, that the Increaſe of the ſenſible Evacuations, eſpecially by Stool and Urine, cuts off the Supply of the Materia Perſpirabilis, in Proportion to ſuch an Increaſe; becauſe, in the firſt Caſe, it is carried off *per Anum* before it can get into the Blood; and in the latter Caſe, before it has gone ſuch Circuits as are neceſſary to convert it, either into nutritious Juices, or break it into Parts ſmall enough to paſs through the Pores. Indigeſtion does much the ſame; ſo that the Quantity which perſpires, both increaſes and decreaſes in Proportion to that which is prepar'd by a previous Digeſtion: Hence *Sanctorius* ſays (*t*), "In the Morning Sleep, after "the firſt Digeſtion is perfected, about a "Pound of the perſpirable Matter goes "off in an Hour; but if it is not per-"fected, not above a Quarter as much." We ought therefore to take the greateſt Care at that Time, that it be promoted.

The Effects of too frequent Coition.

§ 13. It has been ſufficiently prov'd, that a right Diſcharge of all the Animal Functions depends upon a due Tenſion or Springineſs of the Solids; whatever Diſorders weaken this Diſpoſition of the Solids, can't but very much prejudice the whole Conſtitution; and that any violent Actions (as that of Coition is) are deſtructive of the Textures of the Solids, can't be doubted; the Body therefore will thereby be weaken'd, and the ſeveral Parts will not be able to diſcharge their reſpective Offices; whereby Digeſtion, Concoction, and all the natural Evacuations

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(*t*) Aph. 7. § 4. pag. 221.

tions will be diſorder'd, and by draining from the Blood the richeſt and moſt balſamic Parts, will bring particular Weakneſſes, which often-times lay the Foundation of a Conſumption. As the Fibres of the whole Body are hereby over-ſtrain'd, thoſe Parts which are moſt nervous, can't but be moſt injur'd; hence a Weakneſs and Dimneſs of Sight, impair'd Memory, a deprav'd Appetite, Pains in the Head, *&c.*

As too frequent Uſe of Coition is prejudicial, ſo a moderate Uſe of it is beneficial, as may be deduc'd from what has been ſaid in ſeveral Parts of this Book. Thoſe who are experienc'd in theſe Affairs can well tell us, how active, lively and agile they are upon refraining ſome Time from venereal Exerciſe, or uſing it only in a moderate Way, and how dull they ſeem to be after exceſſive Debaucheries.

The Effects of ſtopping an acquir'd as well as cuſtomary and natural Evacuation.

§ 14. Old accuſtom'd Evacuations often-times become at laſt very uſeful and advantageous to the Animal Œconomy, by draining from the Blood ſome ſuperfluous, uſeleſs, excrementitious Matter, which otherwiſe might incumber the fine ſmall Capillary Veſſels, and lay too great a Load upon 'em; or elſe they excrete ſome putrid, acrid and corroſive Particles, which, if return'd into the Blood, might corrupt the Fluids and debilitate the Solids. Hence it appears how dangerous it is to heal up Iſſues, Ulcers, Fiſtula's, or to ſtop periodical Hæmorrhages, Sweating in the Hands and Feet, *&c.* without proper Advice, many having thrown themſelves into Conſumptions thereby. An eminent Inſtance of this we meet with in the *Philoſophical Tranſactions*, Numb. 272. in one who ſtop'd a periodical Hæmorrhage in one of his Thumbs; and we daily meet with Inſtances in ſeveral Perſons, who have render'd themſelves incurable, others have been weak and ſickly 'till the Humours have took their own uſual Courſe again. For when Nature has choſen, and for ſome Time exercis'd new and extraordinary Methods of Œconomy, ſhe ſeems to be as fond of their Continuance, as at other Times, in her moſt regular State ſhe is of that, which is her moſt uſual and ordinary Courſe.

Too great Excretion of Blood, and a Suppreſſion of the natural Evacuations.

§ 15. Too great Hæmorrhages weakens the Fibres, renders the Blood crude, watery and pale, produces Leucophlegmatias, Dropſies, *&c.* But the Suppreſſion of the natural Evacuations, ſuch as the Hæmorrhoids and Menſes, cauſes Inflammations, Fevers, and, in ſhort, moſt Kinds of Diſeaſes, both acute and chronical.

CHAP. VII.

On Affections of the Mind.

The Manner how the Mind affects our Bodies.

§ 1. THE Manner how the Mind or Thoughts operate upon our Bodies, is a Myſtery, and no way to be brought under a Mechanical Rationale; becauſe it is impoſſible to repreſent and delineate, as we do Corporeal Subſtances, that which never comes under the Notices of our Senſes, but in its Effects; therefore we can't have any Notion of the Procedure, by which they are brought about, as we can have of all theſe affected by Phyſical Agents: As it is certain that Affections of the Mind, eſpecially when ſudden and intenſe, do inflame very much, and alter the Conſtitution, ſo far as neceſſarily to bring it under the Phyſician's Care, the wiſeſt muſt therein be contented to eſtabliſh his Rules upon Obſervation only.

Nothing is more obſervable, than that violent Affections of the Mind waſte the Spirits, and bring great Diſorders upon the Conſtitutions, this they ſeem to do, as Stimuli univerſally irritating and twitching the Nerves, in ſuch a Manner as diſturbs their irregular Contractions; for though we can't tell, either how Thought can produce ſuch a Change in the Humours of the Body, or how ſuch a Conſtitution of the Humours can affect the Paſſions of the Mind, yet if by conſtant Obſervation and Experience it can be found, that ſuch a Paſſion or Temper of Mind is always attended with ſuch or ſuch Conſequences in the Conſtitution; and on the other Hand, that ſuch a particular Temperature of the Conſtitution, always affects the Mind with ſuch or ſuch particular Paſſions and Diſpoſitions, it will then afford very ſufficient Ground of Certainty to a wary and conſiderate Perſon in his Reaſoning upon their Conſequences, and in the Meaſures which ought to be taken in rectifying the Diſorders of either; *ex. gr.* If Anger or Chearfulneſs are always found to render the Body lighter, altho' we cannot tell how theſe particular Paſſions do firſt modify any particular Parts of the Body, ſo as to produce that Effect, yet it being plain how Phyſical Agents do the ſame, it is highly reaſonable to conclude, that theſe do it alſo by the ſame Means; *i. e.* thus far we know, that an Invigoration, or an Increaſe of the contractile Force of the Solids will promote Digeſtion, increaſe the Evacuations, and render the Body lighter; ſo that we have the greateſt Reaſon to believe, when we ſee the ſame to be the Conſequences alſo of a Man's being paſſionately angry, or very merry, that theſe Diſpoſitions of the Mind do give that particular Modification, and Degree of Tenſion to the Fibres, as cold Bathing, a cold, clear Air, or moderate Exerciſe, when we ſee them attended with the Conſequences; and as we know theſe Phyſical Cauſes have this Effect by drawing up, contracting and vibrating the Solids, thereby breaking the Juices finer, ſo ought it to be concluded, that theſe Paſſions of the Mind do give the ſame Modifications to the Fibres, by which the ſame Effects are produc'd; what ſeems ſtill farther to convince me in this Opinion is, that in any Paſſions of Joy or Anger the Pulſe is ſtronger and quicker than before; in like manner if Fear or Sorrow are found to be attended with an Increaſe of Weight, it is reaſonable to think that they do it by the ſame Means, by which all thoſe Phyſical Agents produce the ſame Effect, *i. e.* by ſlackening the Fibres too much, abating Digeſtion, and conſequently leſſening the Evacuations; when therefore any Paſſion of the Mind is ſaid to have this or that Effect upon the Body, we ought to conſider that Paſſion only as a Phyſical Agent, as it contracts or relaxes the Fibres, and as it increaſes or leſſens the Evacuations; but in this we are guided only by Obſervation and Experience, which is ſufficient in this Caſe to a Perſon of any tolerable Diſcerning.

The Effects of Anger and Joy.

§ 2. Anger and Joy keep the Fibres in their natural Tenſions, aſſiſt the Secretion and Derivation of Spirits to all Parts of the Body, and conſequently promote the Circulation and Digeſtion, thereby promoting a plentiful Perſpiration, which renders the Body lighter; on the other Hand we alſo ſee, that whatever promotes a free, eaſy Digeſtion and Circulation, will alſo raiſe the Mind with more agreeable Impreſſions, and diſpoſe it either to Joy or Anger.

The Effects of Fear and Sorrow.

§ 3. Fear and Sorrow, as they give a quite contrary Modification to the Solids, they are always attended with quite contrary Conſequences; on the other Hand, whatever checks the Motion of the Spirits, and hinders a free Circulation, and alſo impairs Digeſtion, will give a Slackneſs and Sluggiſhneſs to the Juices, thereby occaſioning Obſtructions; ſo whatever obſtructs Perſpiration, and cauſes a Lentor in the Blood, will diſpoſe the Mind to thoſe uneaſy Paſſions which we call Fear and Sorrow, as we ſee in hypochondriac and hyſteric Affections: As Grief or Fear are found to weaken the Contractions of the Veſſels, ſo thoſe Parts where there are the greateſt Collections of Juices, will the ſooneſt ſuffer by Stagnations or Obſtructions; hence we find by Diſſection, that the Glands of ſome of the Viſcera of ſuch People are ſchirrous, and the other Veſſels are turgid and black (*a*).

They who ſicken upon the Diſorder of the Mind, eſpecially with Grief, are commonly ſeiz'd with the Diſeaſes of the Stomach, firſt complaining of a Faintneſs, and ſoon after of Inappetency, a bitter Taſte in the Mouth, and Thirſt in the Morning, acid and nidorous Crudities, Wind, Detention of the Hypochondria, and the other Symptoms of a diſ-

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(*a*) Bonet. Sepulc. Anatom. Lib. 1. § 9. Obſerv. 16. pag. 226. Tom. 1. & pag. 227. Obſerv. 19, 20. pag. 229. Obſerv. 23, 24. pag. 234. Obſerv. 33. pag. 239. Obſerv. 39. pag. 240. Obſerv. 40. pag. 242. Obſerv. 46. Wharton adenogr. Cap. 12. G. Blaſius, in Obſerv. Anatom. pag. 127. & Obſerv. Med. 22. J. D. Horſt. Obſerv. Anatom. 8. Hæchſtetteri, Obſerv. 3. Decad. 5. Lazar. River. prax. Lib. 13. Cap. 5. Obſerv. Joh. Huldarici Streitter apud Greg. Horſtium. Tom. 1. p. m. 141. Anton. Pozzis, Obſerv. 29. Miſcell. Curioſ. Ann. 4.

order'd Chylification. The Chyle being indigeſted, and pall'd, for the foregoing Reaſons, gradually infects the Maſs of Blood; hence ſpring diverſe Diſeaſes, both acute and chronical, particularly Obſtructions of the Viſcera, the Scurvy, Rheumatiſm, Hypochondriac Illneſs, *&c.* hence we ought in Diſeaſes ariſing from this Cauſe, chiefly to have Regard to the Stomach and digeſtive Faculties.

THE

CONCLUSION.

THAT theſe Methods herein laid down ſhould prove curative in ſome particular Diſtempers, and that too, when ſcarce any Thing elſe will prevail, ſeems to obtain little Credit with moſt People, who, when a Phyſician recommends 'em, look upon 'em as forlorn Methods, and the Effect rather of his Inability to relieve 'em, than of his real Belief that there is any Thing material in what he adviſes. This, together with moſt People's Inconſtancy and Impatience in being confin'd in their Appetites, makes 'em either throw off all Remedies and Reſtraints of theſe Kinds in Diſpair, and give themſelves up to an habitual Indulgence in all thoſe Things that brought on or exaſperated the Diſtemper, or run about changing from Doctor to Doctor, 'till they end with Quack, or die under the Hands of a Mountebank, and ſo are fool'd out of their Lives and Money at once.

It is ſurprizing, that reaſonable Men can imagine, that in any ſmall Time, any poſſible Methods or Medicines ſhould cure, or even ſenſibly relieve a Diſtemper, that, perhaps, was brought with 'em into the World, or at leaſt, may have been ten or twenty Years a breeding by Exceſſes, or an indiſcreet Regimen; I ſhow'd in the laſt Chapter, that if the Humours were bad, they would infect the Chyle, and 'till thoſe bad Humours are either evacuated or chang'd, we muſt expect no Cure, and that is a Work of Time, which muſt be proportion'd to the Greatneſs of the Exceſſes, and to the bad State of the Blood.

But this requiring long Time, much Care, and great Caution, unwearied Patience and Perſeverance, and ſo long a Courſe of Self-denial, that few People are willing to undergo the Courſe, the Failing is therefore moſtly in the Patient himſelf, who will not, or cannot deny himſelf the Gratification of indulging his Palate for a Time ſufficient to bring about the Cure. Some Chronical Diſtempers, indeed, are ſuch, either by having gone too far, or by being *Hereditary*, and interwoven with the Principles of Life, as never to be totally overcome. But however, if the Rules and Cautions laid down in this Treatiſe be carefully, ſteadily, and conſtantly obſerv'd, few Chronical Diſtempers but will receive ſuch Relief and Alleviation by 'em, as to make Life tolerably eaſy; and in ſome Caſes, that is all that Art can do. But in other Chronical Diſtempers taken in *due Time*, where the Viſcera are not quite ſpoil'd, a proper Regimen of Diet, due Exerciſe, and proper Air, with a few other Helps, would infallibly bring about a final Period, and a perfect Cure; eſpecially if the Diet be chiefly compos'd of unfermented Liquors and of young Vegetables, which have ſcarce any groſs, fix'd, or eſſential Salts at all in 'em. This is evident upon

Trial (*b*) and Examination, for theſe yield none, being too light and thin to calcine and incinerate, and the Salts too volatile (and conſequently, ſmall and fit to paſs by Perſpiration, and thereby can be no way injurious to Human Conſtitutions) to endure the Fire, which full-grown Plants, their Stalks and Wood readily do; hence their Juice is very proper for Scorbutic Habits. And in unfermented Liquors, the Salts are ſo envelop'd, that they can't unite to form a Spirit, and are ſo ſheath'd, that they can ſcarce do any Harm (except when they exceedingly abound) to Animal Bodies. Hence it comes to paſs, that a vegetable Diet for a few Weeks or Months together, with drinking unfermented Liquors, will faſten the Teeth when almoſt dropping out, from a Conſumption of the Gums by Scorbutic Salts, and will cure moſt cutaneous Eruptions, and alſo moſt Ulcers, if they be not ſcrophulous, when no Medicine on the Face of the Earth will touch it.

(*b*) *Lowthorp*'s Abridg. of the Philoſ. Tranſ. Vol. 2. pag. 661.

AN

ESSAY

ON THE

CHIN-COUGH.

I HAVE been often ſurpriz'd that our Authors in Phyſic have taken ſo little Notice of the Chin-Cough, ſince it requires their Study and Attention as much as any other Diſtemper, and the preſent Method of treating it is ſo long and tedious, that, as *Willis* (*a*) ſays, *Propter anni mutationem ceſſat potius quam a remediis ſuperatur*, it may indeed eaſe 'em a little, but ſeldom, if ever, cures: This Diſeaſe

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(*a*) De Medicam. Operation. § 1. Cap. 6. pag. 169.

Diſeaſe rarely afflicts Adults, nor yet Infants, but when it becomes epidemical.

Children, from the Weakneſs of their digeſtive Faculties, as well as from their common Food, which is of all others the moſt ſubject to be converted into Phlegm, are for this very Reaſon more liable to this Diſtemper than Adults; I ſay, their Viſcera being lax and weak, the Milk, by following it's own proper Indoles, will either become viſcid, or acrimonious, or both; hence Nauſea's, Gripings, Tumors of the Abdomen, and the like, for then the Primæ Viæ are almoſt lin'd with Phlegm from the Throat to the Anus; hence they are frequently puking, as well from the Phlegm tickling the Nerves, as from it's Acrimony: We know alſo, that the Chyle made by ſuch weak Viſcera muſt be thick and crude, and therefore if the Veſſels of the Lungs are weak, the Blood will be thick and viſcid, eſpecially the ſerous Part, and at the ſame Time the Glands about the Fauces, Trachea and Bronchia, and the Pores, or Excretory Ducts in the Lungs, mention'd by *Hales* (*b*), being relax'd, their Secretions and Excretions muſt be more thick and viſcid, which lodging in the Bronchia and Lungs, irritates the Nerves to promote their Expulſion by Coughing; and if it ſticks ſo cloſe, that it can't be eaſily expectorated, it ſtrains the Infants to ſuch a Degree, as to throw them into Convulſions; hence we ſee this Diſtemper is caus'd by a great Quantity of thick Phlegm obſtructing in, and adhering to the Lungs and Parts adjacent, and that the Phlegm is caus'd by a Laxity of the Fibres and the Diet.

Therefore, from what has been ſaid, we ſee the curative Indications are firſt, to attenuate and diſſolve the Phlegm; ſecondly, to corroborate or ſtrengthen the Fibres, to prevent any other Viſcidity.

The firſt is done by ſuch Things as inſinuate and ſtimulate, to cut, as it were, the Phlegm, and to give the Veſſels a forcible

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(*b*) Stat. Eſſay, Vol. 2. pag. 73. Exper. 11. § 3.

forcible Vibration, whence it will be broke and reduc'd ſmall enough to be diſcharg'd out of the Body.

Secondly, The Solids muſt be ſtrengthen'd, for although the viſcid Humour be attenuated, yet if one of the Cauſes remain, *viz.* the Laxity of the Veſſels, there will be ſoon a freſh Supply of Phlegm, and this is beſt done by gentle ſub-aſtringent, aromatic Medicines.

Thirdly, This viſcid Humour is not only to be attenuated, but alſo evacuated, and if it can't be attenuated ſo fine as to paſs off thro' the Pores, it can't be evacuated by Stool, for then it muſt be attenuated ſo fine as to come through the Capillary Veſſels into the Inteſtines; moreover, at that Time Purging wou'd deſtroy one of the curative Indications, nay, if the Patient was purg'd when almoſt recover'd, he wou'd be in great Danger of a Relapſe, as I obſerv'd in two Children: It is, in many Things, like to an Intermitting Fever, as we ſhall alſo ſee, it has alſo been cur'd by Frights, as well as the Ague, as

Willis tells (*c*) us, *Alterum pro tuſſi puerorum convulſiva remedium eſſe ſolet ut ſubito quodam timore afficiantur.* As this Humour, I ſay, can't ſo ſafely be carried off by Stool, and by Vomiting it can't, we then have no other Way but by Urine, which may ſafely be done, and how beneficial Diuretics are in many Diſorders of the Lungs no Phyſician is ignorant.

When therefore I am firſt call'd upon, if the Child be in Danger of being convuls'd, I then am forc'd, in order to gain Time, to take ſome Blood from it, otherwiſe I wou'd never do it, becauſe it is contrary to the ſecond Indication; and thoſe Children who were bled, or much purg'd, were always longer in recovering than thoſe who had never been bled, but I have not had ſo many of 'em under my Care as to be certain, becauſe other Circumſtances might contribute towards prolonging the Time, I only mention it that the Reader might be more accurate, it being what I obſerv'd, and cou'd

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(*c*) De Medic. Operat. § 1. Cap. 6. pag. 170.

cou'd impute it to nothing elſe; if (as it moſtly happens) the Primæ Viæ abound with Phlegm, then I gave a little Oxymel Scillit, or the like, and deterſive Purges, as I thought proper, but if I thought thoſe Paſſages clear, that the Medicine cou'd get freely into the Lacteals, I never wou'd uſe either Vomiting or Purging, the firſt, becauſe it commonly ſhook them, and made 'em cough the more, and the laſt, becauſe it was contrary to the Indication of Cure, notwithſtanding it being the greateſt Part of the common Method of treating them at this Time.

I come therefore now to the firſt Indication of Cure, *viz.* to attenuate or diſſolve the Phlegm. It ſeems plain, that the Viſcidity of the Phlegm ought firſt to be broken, and what is obſtructed in the Capillaries to be diſlodg'd, becauſe to draw up the Solids whilſt ſuch Obſtructions remain, is the moſt likely Way to fix that viſcid Matter the faſter, thereby aggravating the Diſtemper; moreover, it wou'd be a Task of Difficulty to bring up their Fibres to their due Force with ſuch a Load upon them, and for theſe Reaſons 'tis we frequently ſee ſo much Miſchief done by giving the Jeſuits Bark, or any ſuch ſub-aſtringent Remedies as anſwer that Intention of contracting the Fibres, before the Lentor of the Humours is ſufficiently remov'd, thereby rivetting Obſtructions, which, according to the Place they are fix'd in, cauſe various Diſorders; hence Apoplexies, Epilepſies, Vertigo's, Aſthma's, Jaundice, *&c.* it does indeed often happen that a Removal of the Lentor is brought about upon bracing the Solids only, as we ſee People ſometimes cur'd by ſudden Frights, and the like, but yet, as it may be attended with ſuch ill Conſequences as above-mention'd, we had better act ſafely.

It follows then to know by what Means theſe Intentions are brought about; the firſt is brought about, as was ſaid before, by mixing ſuch Particles with the Food, as will incide or inſinuate themſelves into the viſcid Matter, and at the ſame Time gently ſtimulate the Veſſels; for this Intention I always us'd Millepedes, theſe with the teſtaceous Powders, as I ſaw Occaſion, being adminiſter'd two or three Days, not only help to cut and diſlodge the Phlegm, but alſo help to carry a great deal of it out by Urine, and how far Diuretics have gone in curing Diſorders of the Lungs Experience ſhews us daily, and the Reaſon is ſo obvious, that I need not waſte any of the Reader's Time about it, but proceed to the ſecond Indication, *viz.* to brace up the Fibres, and at the ſame Time gently to ſtimulate 'em; and this is done by ſub-aſtringent, ſpicy Medicines, becauſe by ſuch both the Intentions are often anſwer'd at once, and the very beſt Medicine for this Purpoſe is the Cortex Peruvian. which in the few Caſes I have try'd it, with the Method above-mention'd, has been as certain a Cure in this as in the Ague, and no Wonder, for if we examine it's component Parts, we ſhall find it endued with the very Virtues we deſire; in order therefore to know how it diſplays it's Virtues, we muſt take it to Pieces, and ſubject it to the ſame Ways of Examination as other Bodies, which is to enquire into it's conſtituent Particles; and herein when we come to conſider it's Contexture, as it appears to the naked Eye, it's Roughneſs upon the Palate, and the Difficulty of reducing it into a fine Powder by pounding, or deſtroying the natural Diſpoſition of it's conſtituent Parts by Infuſion or Digeſtion, and drawing from it by ſuch Means, any Tincture endow'd with the ſame healing Virtues, as it is known to have when it is given in Subſtance; when all theſe, I ſay, come to be conſider'd, it will readily appear, that it is made up of Parts very irregular, pointed and ſolid.

By the Texture of the Bark, and the Diſpoſitions of it's component Parts, which are diſcernable to the naked Eye upon breaking, it is plain that they are like little Cylinders or Needles, ſhooting one over another, not much unlike ſeveral Salts upon their Cryſtallization, and when it is broke tranſverſely, any one may ſee their Points, which Shape alſo they may be ſeen to continue upon pounding, as far as the naked Eye can follow them.

It's Solidity is alſo manifeſt from the Difficulty of reducing it into an impalpable Powder, but moſt of all by the little Alterations it undergoes even by long Infuſion; for if it be then examin'd, and after the Liquor is ſtrain'd from it, if it be again dried, it will not be found to have loſt much of it's Weight, and but very little changed either in Colour or Taſte, it loſes indeed moſt of it's Bitterneſs, that being in it's more volatile Parts, but it's Roughneſs remains, and upon Trial it hath been generally found, that if it be then powder'd and given in Subſtance, it will make a Cure as effectually (though perhaps not ſo ſoon) as when given before ſuch Infuſion: The Solidity likewiſe, as alſo the angular Figures of the component Parts of the Bark, are further manifeſt from their Aſtringency and Roughneſs in the Mouth.

But beſides theſe groſſer Parts, which the Bark is compounded of, and which not without great Difficulty broke very ſmall, it hath alſo in it's Compoſition ſome Parts very ſmall, and eaſily diſſipable, as appears by that which ſo eaſily riſes and flies off upon breaking it, as likewiſe by that penetrating Bitterneſs which is in it upon the Palate.

In this View then it will not be at all difficult to conceive how this Drug is of Service in anſwering both the Intentions of Cure, for both by the Smallneſs, Solidity and Irregularities of it's Parts, as ſoon as it mixes with the Blood, it can't but give it a greater Momentum, and increaſe the Impulſes of it's Parts one againſt another, upon which Account a great many Coheſions will be broke, and other Parts prevented from running into ſuch cloſe Contacts, as occaſion thoſe Coheſions, and ſo the whole Maſs of Blood will be thereby preſerv'd fluid. The other Intention will be anſwer'd by it's corrugating the Fibres, and rendering the Contractions of the Veſſels more brisk, by which Digeſtion will afterwards be better perform'd, and conſequently the Perſon will thereby be invigorated; for ſince the more the extream Capillary Veſſels of the Arteries are contracted, ſo much the greater will be the Force requiſite to impel equal Quantities of Blood through in equal times, the Blood muſt needs therefore be the more accumulated in the Arteries, and as they are elaſtic, it will be thus impell d with greater Force through the ſmaller Capillary Veſſels, and it will thereby, both acquire a greater Degree of Heat, and be alſo more attenuated and digeſted; hence the Cortex is, in a double Capacity, an Attenuator, as Mr. *Hales* calls it (*d*). That the Bark is very efficacious this Way, in drawing up the Fibres, is further confirm'd by it's Effects upon ſuch who are ſubject to ſweat, as in the Sudor Anglicanus, and the like, which is brought about by it's aſtringent Quality: If then it has ſo great an Efficacy as an Aſtringent (as it certainly has) in the Stomach and Inteſtines, where the Fibres are ſo much guarded by their natural Mucus, which

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(*d*) Hæmaſt. pag. 136, 137. Exper. 18. § 5.

which is always in great Plenty lodged in them, with how much more Force muſt it needs act in the ſame manner upon the Solids, when it is brought into much ſmaller Veſſels, both as it paſſes into the Blood, and when it comes there? For where a Particle in the Stomach chances to ſtrike againſt a Fibre once, when it comes into the ſmall Capillary Veſſels, it's more likely to do it a thouſand times, for their, *viz.* (the Capillaries) Coats bear a much greater Proportion to the contain'd Cylindrical Fluid, than thoſe of the larger Veſſels, therefore as the Blood comes to be pretty well charged with theſe Particles, the Fibres in all Parts are corrugated, whereby the whole Body acquires ſuch a Strength and Firmneſs, as will occaſion the Attenuation of the viſcid Matter, and expel it out of the Body. Thus I have endeavour'd to account for what I found by Experience to be true in Fact, and which I communicated to the late Dr. *Woodhouſe* of *Nottingham*, who made Trial of it, and found it to anſwer his Expectation.

I ſhall now proceed to ſhow the preceeding and the then State of the Air wherein the Chin-Cough was ſo epidemical, and in which the Bark ſucceeded.

The Quickſilver in the Gage of the Barometer, during the Courſe of the Year 1730, generally ſtood about 28, ſeldom roſe to 29, but very rarely to 29 $\frac{1}{2}$; and this was occaſion'd by the moiſt Vapours and dampy Rains that affected both the Spring, Summer and Autumnal Seaſon of the Year, whereupon the Spring of the Air was extremely relax'd. *Vid.* § 13. of Air.

But in the Year 1731, rarely did it fall beneath 29 $\frac{1}{2}$, and often roſe to 30, and 30 $\frac{1}{2}$; this was occaſion'd from the extreme Dryneſs of the Seaſon, a Drought ſo univerſal, as ſcarce to be parallel'd in the Memory of Man, and which in the Nature of Things muſt produce very fatal Effects in the Motions of human Fluids, where the vital Organs were languid and unable to ſupport the Shocks of theſe two oppoſite Extreams. *Vid.* § 11, 14 and 15. of Air.

About the 24th of *December* 1731, it ſuddenly became a hard Froſt, and ſo continu'd 'till the 29th, and then as ſuddenly broke into a warm Thaw; theſe ſudden Changes had very fatal Effects upon Perſons whoſe vital Organs were weakly diſpos'd.

The Barometer was almoſt at the higheſt, and the Thermometer very low about the Beginning of *January*, when the Froſt return'd with Snow, but ſoon thaw'd again, and by Intervals froze and thaw'd during this Month, and in the Beginning of *February* the Froſt quite ended, but the cold dry Weather, with Northerly Winds, laſted 'till about the Middle of *April*, then ſome Rain fell, the Winds then were Eaſterly and Southerly 'till the Beginning of *May*, when the Seaſon was warm and pleaſant.

About the Middle of *January* 1731-2, the Chin-Cough began to be very epidemical and was more or leſs fatal as the Weather alter'd.

The Method above-mention'd being follow'd in that Seaſon by nineteen Children (they being all I had under my Care at that Time) ſeventeen of 'em recover'd in ſo ſmall a Time as to ſhow they were cur'd by the Medicine, and not by any Change in the Temperature of the Air. One of thoſe who died, did not live two Days after I was conſulted, and the other had ſeveral Convulſive Fits before I was ſent for. It is worthy of Obſervation, that two of the Children who had recover'd, upon a Looſeneſs coming, relaps'd, but were ſoon recover'd again; the ſame is obſerv'd in an Ague. We muſt alſo obſerve, that during this epidemic Seaſon, Agues were ſtirring in the Country, and that the Sick had a troubleſome Cough.

In *October* and *November* 1735, I tried the foregoing Method again in five other Children, all which recover'd very ſoon.

Notwithſtanding my Succeſs thus far, I was deſirous to try if I could make the Medicine yet more efficacious, by mixing with it ſome of the ſtrongeſt *Inciders* our *Materia Medica* affords; and after having examin'd ſeveral Authors, with Regard both to the Virtues and Safety of Medicines, I found none ſo likely to ſucceed as *Cantharides corrected with Camphire*, which is by that Means made as *ſafe* and *innocent* a Medicine as any in the whole *Pharmacopœia*, when in the Hands of a skilful Phyſician, but like Opium or Mercury, is a dangerous Medicine in the Hands of the Ignorant. Leaſt my Reader ſhould think the internal Uſe of Cantharides is either new or unſafe, I will look back into the Practice of ſome of the moſt eminent Phyſicians in ſeveral Ages, and ſhow that they in many Caſes us'd 'em internally, and then I will proceed to make appear how they are beneficial in the Chin-Cough, and at the ſame Time I will ſhow the Virtues of the Camphire which corrects the Cantharides.

Hippocrates (*e*) ſays, *Potionem aquæ ſubter cutem laboranti concinnabis, ſi* cantharidum *trium, ablato cujuſque capite, pedibus & alis, corpora ex tribus aquæ cyathis contrita exhibueris.* Again he ſays (*f*), *Cantharides etiam ſine alis & capite tritas quatuor, & ex vini albi hemina dimidia dilutas exhibeto. Jam vero etiam pauco melle affuſo, mox ita propinato, idque bis aut ter in die bibat.* And again he ſays (*g*), —— *Aut cantharidum ventres exhibe.* *Galen* (*h*) ſays, *Vanam illam cautelam eſſe, nonnullos,* citra bibentium læſionem *diuretico medicamento ex* cantharidibus *confecto uſos fuiſſe.* Again (*i*), *Non tantum externum earum uſum laudat ad lepras & pſoras, ſed præceptorum ſuorum quendam illas medicamento diuretico miſcuiſſe, affirmat.* *Dioſcorides* ſays (*k*), *Nonnulli* cantharides *antidotis admiſtas Hydropicis in auxilium tradi-*

(*e*) Lib. de Diet. in morb. acut. § 4. pag. 406.

(*f*) Pa. 552. Lib. de morb. inter.

(*g*) Lib. 2. de morb. mulier. § 5. pag. 673.

(*h*) Comment. in *Hipp.*

(*i*) De ſimplic. medicament. facultat. Lib. 11. Tom. 5. Text. 44.

(*k*) Lib. 2. Cap. 66.

tradiderunt. *Capavaccius* (*l*) ſays, *Ego ab omnibus deſertos in Hydrope & Stranguria plane Cantharidum uſu reſtitutos vidi.* *Oſwaſdus Gabelchoverus* preſcrib'd as follows; *Rec. Cantharid. præpar. Scrup.* 1. *Spec. Diatrag. Frig. Drach.* 1. *aq. ceraſ. nig. Unc.* 1. *miſ.* *Hieronimus Fabritius ab Aquapendente* (*m*) gave 1, 2, 3, or at moſt four whole Cantharides. The famous *Bartholin* (*n*) commends 'em, *Nonnulli, ait, forma pulveris, alii Trochiſcorum admixtis aliis corrigentibus Cantharides propinant, tutiſſimum per infuſionem modum aperiam: Scrupulus unus Cantharidum in pulverem redactus infundatur unciis tribus vel quatuor vini* Rhenani *vel ſpiritus vini, ſtetque in infuſione per aliquot dies, & ex contento liquore cochlear. unum aliis ſeu vini, ſeu cereviſiæ admiſceatur, & ex hoc mixto, primo die unum, altero die duo cochlearia, & ſic deinceps propinentur in Gonorrhæa virulenta, lotii ſuppreſſione, & calculo; felicem hujus potionis eventum expertus ſum.*

(*l*) Pag. 736, 737.
(*m*) Part 1. pag. 258.
(*n*) Hiſt. Anatom. Centur. 5. Hiſt. 82.

ſum. And again he ſays (o), *De Cantharidibus, quarum felicem ſucceſſum non ſemel ſum expertus.*

We read, (*p*) that in *Hungary* they gave *Pro una doſi Cantharides pulverſatas numero decem, pulvis epotus ipſis interdum largum ſudorem, interdum copioſum urinæ fluxum excitat, citra ullum tamen dolorem. Trincavellus* (*q*) ſays, *Cantharides utiles ſunt ad atterendos & comminuendos calculos & ad cienda lotia, & ſepas cum magna utentis utilitate, &* citra ullam noxiam, *cum quis utitur recte paratis.* And *Fiſcerus* (*r*) commends his moſt noble Extract of *Cantharides.* The learn'd Dr. *Charleton,* formerly Fellow and Preſident of the College of Phyſicians (*s*) *Cantharides tanquam optimum medicamentorum commendat.* And Dr. *Liſter,* formerly Fellow of the College of Phyſicians, and of the Royal Society, in

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(*o*) *Ib.* Centur. 5. Epiſt. 53.
(*p*) Miſcel. Curioſ. Germ. Tom. 1. pag. m. 256.
(*q*) Pag. 906.
(*r*) Corp. Med. Centur. 3. Cap. 32. de Hydrope.
(*s*) Lib. de Lithiaſi.

in a Conſultation with Dr. *Barwick* (*t*) preſcrib'd as follows, *Rec. Cantharid. probe toſtar. Scrup. ſſ. aq. ſperm. Ranar. Lib.* 1. *m. f. Hauſt.* And *Platerus* (*u*) preſcribes 'em as follows, *Rec. Cantharid. ſicc. No.* 4. *Lap. Spongiæ Scrup.* 2. *ſem. Melon. Medull. Drach.* 1. *ſſ. Sacch. Cand. Drach.* 1. *pulveriſata dentur cum decocto ſem. Lini vel ſero lactis.* To all theſe may be added the preſent Practice of Phyſicians in moſt Places. The Authorities of all theſe great Men, as well Ancients as Moderns, are ſufficient to prove the Innocence and Safety of the Medicine (*w*).

Cantha-

(*t*) Exercit. de Calcul. Renum. pag. 243.

(*u*) Opera Med. Cap. de Aſcite.

(*w*) If the Reader wants to be farther convinc'd, let him conſult Conſil. Med. *Cratonis*, pag. 380. *Bernard. Vezzachæ*, Obſerv. 51. pag. 107. *Nicol. Fontanum* de morb. Mulierum, pag. 100. *Amat. Luſitan.* Centur. 4. Curation. 19. pag. 338. *Zacut. Luſitan.* Lib. 2. Hiſt. 67. Obſerv. 32. *Æginet.* Lib. 7. Cap. 10. *Actium*, Lib. 3. Cap. 174. *Plin.* Nat. Hiſt. Lib. 29. Cap. 4. *Ibid.* Lib. 11. Cap. 25. *Joan. Heurnii* Method. ad Praxin. pag. 247. *Job a Mekeren*, Obſerv. 34. pag. 146. *Etmuller.* not. in *Schroder.* pag. 247. *Fallop.* de Med. ſimpl. purg. Cap. 6. pag. m. 37. *Rendelet ap Renod.* Inſt. Pharmac. Lib. 4. Cap. 9. pag. m. 106. *Geyer.* Tract. Phyſic. Med. § 3. Cap. 4. *Joann. Lang.* Epiſt. Med. 47. *Wedelium.* de antidotis ſpecial. Lib. 11. § 11. Cap. 5. *Hoffman* Paraleipom. officin. Cap. 17. pag. 647.

Cantharides abound with a ſubtile, cauſtic Salt, by Virtue of which they cut the Phlegm, and at the ſame Time ſtimulate the Veſſels, and promote a Diſcharge by Urine. The Cantharides are corrected by Camphire, which is extremely volatile, and is very diaphoretic, it very much attenuates the Viſcidities, which obſtructs the Capillaries, hence it often cures Agues. Camphire is known to eaſe Pain, and often to promote Sleep in Fevers, when Opium will not.

I order'd a Scruple of Cantharides, and as much Camphire, which, when well mix'd, I order'd to be mix'd with three Drachms of the Extract of the Bark, of which Mixture I gave the Children 8 or 9 Grains every third or fourth Hour, according to the Circumſtance of the Caſes, in a Spoonful of ſome ſimple Water or Julap, in which I had diſſolv'd a little Balſam Copaiv. the Childrens Drink was Emulſ. com. or the like. By following this Method, I perform'd the Cures very ſoon, ſome in five or ſix Days, as I can produce many Vouchers to witneſs, particularly Mr. *Dent*, Apothecary, in *Selby*, who has us'd it in the preſent epidemic Chin-Cough according to my Preſcription. This Method is not proper in ſuch Chin-Coughs as proceed from a thin, ſharp Rheum, but I believe in that from a tough, viſcid Phlegm, it will ſcarce ever fail, at leaſt it has not fail'd yet.

Thus, Reader, I have faithfully deliver'd to you, what I have found out and obſerv'd to anſwer in all the Conſtitutions of the Air for the ſeven Years laſt paſt, in which the Chin-Cough was epidemical four Seaſons.

FINIS.

2 Pts. [illegible]